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ESSAYS, MONOGRAPHS, AND CASES.

Mammary Abscess occurring during Lactation. A Lecture delivered in the University Medical College, New York, by T. GAILLARD THOMAS, M.D., Physician to Bellevue Hospital.

Anatomy of the Mammæ.—The lacteal glands, or mammæ, are composed of numerous follicles grouped together; forming lobules, which penetrate to different depths into the structure of the organs, and give them the character of racemose and conglomerate glands.

Each lobule has its own excretory duct; this joins those from neighboring lobules, and in this way growing larger and larger, until they become reduced in number to fifteen or twenty capacious canals, they pass upward, to end at the nipple by as many small mouths. These dilated portions of the milk-ducts or lactiferous tubes are called reservoirs, and, although not largely developed in the human subject, in the cow will contain a quart of fluid.

Each of the lobules above mentioned is separated from its neighbors by a considerable quantity of areolar tissue, which admits of the free motion of one upon the other, and serves as a bed for the blood-vessels

and nerves of the organs. This is the proper parenchyma of the mammæ, and, according to Todd and Bowman, exists in them in "extraordinary abundance."

It is important that you should recognize the fact that this areolar tissue is extremely dense and fibrous, and that it serves not only the purposes of connective material, but that it proves protective and supporting. Passing throughout the gland between the lobules and ducts, it sends strong prolongations to unite with the posterior surface of the skin, which are styled by Sir A. Cooper the "Ligamenta Suspensoria;" and at the periphery of the gland it forms a proper tunic, very much like the "tunica albuginea" of the testicles, or that of the ovaries. In its passage throughout the gland, this dense areolar or fibroareolar structure forms alveolæ, or vacant spaces, which are filled by adipose tissue; a tissue which Cruveilhier tells us may be found at the very centre of the glands, between the lobules, and in obese women even between the follicles themselves. These alveolæ do not communicate freely with each other, hence the remarkable localization of inflammations attacking the superficies of the gland.

The mammæ rest upon the great pectoral muscles, and are separated from them by a layer of areolar tissue, which enables them to move about as freely upon their bases as they do. This layer of areolar tissue, which for convenience we may style the submammary, is susceptible of some remarkable changes, not the least of which is great distention after repeated lactation; indeed, Velpeau quotes Nélaton for the assertion that a synovial sac ("*une sorte de bourse synoviale*") may form there, which is liable to a variety of effusions and inflammatory processes.

The arteries of the mammæ arising from the thoracic branches of the axillary, from the intercostals, and from the internal mammaries, penetrate to the interior or interlobular portions of the glands, and spread themselves in a fine network upon the ultimate follicles.

In absorbents the mammæ are rich, for the investigations of Cooper, to whom we owe almost all our knowledge of their minute anatomy, have demonstrated the presence of two sets; the one superficial and subcutaneous, the other penetrating to the interlobular regions.

The mammary nerves arise from the intercostal and thoracic, and a distinct connection with the great sympathetic exists.

But to return to the ducts and follicles. Were it possible to remove one lactiferous tube and its follicles from the surroundings which we have just been describing, one extremity would be the mouth of the duct as it ended in the nipple; the other would resemble a bunch

of grapes, each lobule appearing with its numerous follicles or clusters of milk-cells, like a cluster of grapes around one of the terminal extremities of the stem.

Next we will take a section of this tube and its clusters of follicles, and examine them under the microscope. The follicles are very small, each being, according to Sir A. Cooper, about as large as a hole pricked by a very fine pin in a piece of paper, and by measurement giving us only the $\frac{1}{100}$ th of an inch. Small as they are, however, the powerful lens shows us that they are lined by a layer of delicate epithelial cells, whose function it is to separate from the blood the first food of the mammalian being. As the eye leaves this extremity of the lactiferous twig and passes on towards the duct which leads from it, a stronger structure begins to appear; its walls show fibrous and yellow elastic tissue, and a lining of columnar epithelium. As we go on, the tube increases, until, towards its mamillary end, it grows small, and becomes sphincteric at its termination, being finally closed by surrounding contractile fibres, like those of the Dartos.

I have already informed you that at the superficies of the mammæ the areolar tissue arranges itself in the form of a tunic or external covering; this is further covered by a thick layer of adipose tissue, which sometimes becomes very voluminous, and explains the fact that fat women with immense breasts will often prove poor nurses, since the size of the organs does not by any means insure extensive glandular development.

Viewed as a whole, the mammæ may then be said to be two glands, composed of lobules and ducts, bound together by dense areolar tissue, in which run blood-vessels, absorbents, and nerves; the mass thus formed being snugly packed away between the areolar tissue which separates it from the pectoral muscles, and that which forms its external tunic, and which is bounteously supplied with an adipose accompaniment.

Physiology of the Lacteal Secretion.—Between these glands and the uterus a direct and prominent sympathy shows itself from the moment of conception, and indeed is sufficiently evident in the unimpregnated condition. Towards the fifth month of utero gestation, an actual secretion of milk begins, the breasts grow hard and irregular in contour, become tumid and more or less painful; and this state continues until the period of parturition.

After the parturient act, no immediate increase of sympathetic influence is manifested; the breasts, indeed, appearing affected by the sanguineous loss, the vomiting, physical and mental suffering, and ab-

stinence from food incident to that process, become less tense than they were before, and their flabby, soft, and collapsed aspect will often alarm the primiparous mother, lest she lack nourishment for her offspring.

On about the third day, however, the enfeebled sympathies begin to manifest themselves and to increase in development; the breasts swell and become harder and more irregular than before, their temperature is increased, and they become painful and tender. Now, too, the constitution of the woman begins to show evidences of disturbance; the pulse becomes quick, the skin warm and dry, chilliness is often complained of, the patient is restless, thirsty and uncomfortable, and her attendant designates as "milk fever" the *ensemble* of her symptoms.

If, at such a period as this, a section of the gland were placed under the microscope, we should find the epithelial cells of the follicles larger and much more numerous than in the unimpregnated female, and they would be found filled with the constituents of the coming secretion, fat globules being the most distinctly discernible. The lactiferous tubes would be loaded with a thick, yellowish, turbid mixture, to which Donné has given the appellation of Colostrum, and which, though upon being squeezed out is apparently thinner than milk, has been proved by chemical analysis to be really thicker.* Under the microscope, this fluid shows the presence of some irregular oval bodies, each composed of a group of minute oil-globules, imbedded in a mass of organic substance. They vary from $\frac{1}{1750}$ to $\frac{1}{2000}$ th of an inch in diameter, and are the "colostrum corpuscles" of Donné.

Now let us glance at the parenchyma of the glands and its contained vessels and nerves. The areolar tissue between these tumid follicles is swollen, by reason of its blood-vessels being turgid from increased flow of blood, which is first stimulated by the above-mentioned sympathy, and then interfered with in its return by pressure from the distended lobules. This pressure the strong and determined arterial flow overcomes; but the feebler venous current is unable to do so, and a mechanical congestion results.

Between these lobules, infarcted by a semifluid secretion, and the blood-vessels distended by an active (physiological) and a passive (mechanical) congestion, lie the nerve filaments, the results of compression of which are pain, tenderness, and throbbing.

You will perceive, by even this superficial examination, that at such a time all things are particularly favorable for the alighting of inflam-

* *Vide* Lehman, Vol. II., p. 63.

matory action, and for its progress to great engorgement and suppuration. Indeed, it is not at all to be wondered at that such a state so often produces those pathological conditions, for the physiological action so prepares the way for that which is pathological, that it is hard to draw a dividing line, and say where one ends and the other begins.

Seats of Mammary Inflammation.—The parts of the mammæ which are ordinarily affected by acute inflammation are:

- 1st. The lactiferous tubes and follicles.
- 2d. The fibro-areolar tissue; subcutaneous, interlobular, or sub-mammary.

Inflammation of the Lactiferous Tubes and Follicles.—This species of mammary inflammation corresponds to, and is produced by, much the same kind of cause which would result in bronchitis, catarrh of the bile-ducts, orchitis, and other like tubular inflammations; and its special causes may be enumerated as:

- (a.) Exposure to cold.
- (b.) Irritation from inflamed nipples.
- (c.) Excessive lactation.

Symptoms.—The symptoms of this inflammation are generally so well marked in the beginning, that it may readily be distinguished from that originating in the areolar tissue; if, however, the case has advanced, no diagnostic difference will be found to exist. At its inception, it may be recognized by:

- (a.) Rigors and fever.
- (b.) Deficient excretion of milk.
- (c.) Pain upon suction.
- (d.) Hard and excessively painful points in the breast.
- (e.) No *general* tumefaction, redness, nor tenderness.
- (f.) Great suddenness of invasion.

This is the state that is so often found as a consequence of exposure to a draught, or to a shower of rain, and which sometimes so readily passes off by the use of fomentations, as practiced empirically by all nurses. Should the disease, however, progress unchecked, lacteal engorgement of the follicles first results, then inflammation of the areolar tissue; and what was in the beginning a simple catarrh of the ducts and follicles, soon becomes one of true mammitis, or inflammation of the parenchyma of the gland.

Diagnosis.—I wish to leave in your minds, gentlemen, a very distinct idea concerning the essential difference between such an inflammation, commencing in the milk-ducts and follicles, and preventing

the flow of milk, from a simple lacteal engorgement, the result of non-evacuation of that milk which has been secreted; for the one is a comparatively unimportant affair, while the other, unless well managed, will end in abscess. Velpeau describes these states synonymously, (or, rather, confounds the two conditions;) and although no man lives to whose opinion on such a subject I would sooner bow, I cannot agree with him; for, after observing closely at the bedside, and discarding all theory, I am convinced that he is incorrect. With the motto, "*Nullius addictus in verba magistri jurare*," let me try to sustain this view by the relation of a case of inflammation of the milk-ducts and follicles as a result of cold.

Mrs. R., a multipara, was sitting, four weeks after delivery, before an open window in a loose evening-dress, when she was taken with a chill, which was followed by fever, and pain in one breast. She was soon after seen by me, and upon examination, I found a hard tumor near the surface of the organ, about the size of a walnut, and excessively painful. The pain was increased upon lactation, which seemed to produce no diminution in the size of the swelling.

I will not detail the treatment adopted. Suffice it to say, that after about two weeks had passed, signs of inflammation of the parenchyma showed themselves, and that an abscess was the result. Now, what was this? An engorgement of milk? If so, why did it occur so suddenly, from those causes which we know so often result in inflammation of mucous tracts, with so much constitutional excitement, and why did only one lobule of the gland suffer? Was it inflammation of the parenchyma? Then why was there no heat, redness, and rapid tendency to suppuration, which Velpeau and most others acknowledge characterize this state? My belief is, that the mucous membrane of one lobule, and probably of its excretory duct, was inflamed; that this resulted in obstinate lacteal engorgement, which in turn resulted in mammitis.

We commonly have lacteal engorgement when a nursing woman's child is taken from her; does this, *before it has resulted in inflammation of the parenchyma*, ever give such constitutional signs?

But I cannot give you a better substantiation of my view of the subject than by detailing one of Velpeau's numerous cases, which I think will better argue in my favor than anything which I can say.

Obs. VIII.—"Lacteal engorgement resulting from exposure to cold fifteen days after a second confinement."

The female was delivered, and did well until the fifteenth day, when the narrator proceeds to say: "Then the patient, who was exposed

to cold, was taken with chills, and a very high fever, which, however, lasted a short time. A severe lancinating pain established itself at the same time in the right breast, which was at once covered with an emollient poultice. *Two days after the patient observed that the breast became engorged, and became more and more painful.*" The Dr. saw her on the first of January, one month after delivery, and therefore fifteen days after the chill and pain in the breast; then, he says, "the right breast presents at the interior portion a large swelling, indistinct, sensible to the slightest pressure, with some hardness, and without cutaneous redness. *This engorgement seemed to have come from the interior of the breast, and to gain insensibly the external part by following the lactiferous ducts.*" (The italics are all mine.) So far, I think, you will not deny me considerable support from this history; but now listen to the treatment, and its results. "Fifteen leeches were applied near the painful spot; on the next day the pain had disappeared, and the engorgement, on which poultices were kept constantly applied, had notably diminished." And why did they diminish? Not because leeches and poultices can disgorge the breasts when choked with milk, for it would be irrational to suppose this, but because they relieved inflammation in the follicles and ducts, and thus allowed secretion and excretion to go on, where they had been before interrupted.

These are the means by which one state may be distinguished from the other:

<i>Lacteal engorgement shows itself by:</i>	<i>Inflammation of follicles and ducts by:</i>
Gradual hardening of lobules.	Sudden hardening of lobules.
No pain at first.	Pain sudden and severe at first.
No chill, nor high fever.	Chill, and very high fever.
Several or many lobules affected.	One or two only affected.
No great tenderness on pressure.	Great tenderness on pressure.
Lactation and friction relieve.	Lactation and friction do not relieve.
Breasts full and rotund.	Breasts rather flabby, except at one spot.
Excretion of milk readily excited.	Excretion not readily excited.

Be it remembered, however, that lacteal engorgement alone may produce, if neglected, inflammatory results, (perhaps in the ducts and follicles, but more commonly) in the parenchyma of the gland.

Mammitis, or Inflammation of the Parenchyma of the Breasts.—This disease bears to pneumonitis the same relation which inflammation of

the ducts does to bronchitis; and as pneumonitis may result from bronchitis, or arise primarily, so may mammitis be either secondary to inflammation of the ducts, or have a cause which produced it as the original affection. As, however, there are three distinct divisions in the areolar tissue of the mammae, in each of which it differs, (in the one being accompanied by much adipose tissue; in another, containing much of the fibrous element; and in the third being loose and purely areolar,) we are forced to recognize three varieties of inflammation arising in it:

1st. Subcutaneous.

2d. Interlobular.

3d. Submammary.

In the first of these, the inflammatory action is confined to that portion of the areolar tissue which is peripheral or subcutaneous; and although it may do so, does not necessarily pass into that which is deeply interlobular. In the second, the morbid process may arise externally, and pass inward; but more commonly arises internally, and subsequently affects that portion of the areolar tissue which is more superficial. In the third, the pathological process may be confined to the submammary tissue, and pus collecting therein may evacuate itself by coming to the border of the mamma.

Fortunately, it is not commonly the deep interlobular areolar structure which is thus affected, but that which is superficial, external to the gland-structure, and dividing only the most superficial of the lobules. This superficial inflammation is of course much less severe in its results than would be that which is more deeply seated, in the gland itself, or in the submammary tissue; but, as all three are inflammations of the same kind of structure, and this structure constitutes one of the elements of the mammae, I have deemed it best to regard them all as mammitis, or inflammation of the parenchyma of the mammae. True, a purely subcutaneous or submammary abscess might arise without any portion of the gland-structure being affected, but the obstetrician will rarely meet with a perfect case of this kind; and as our nomenclature should apply to the rule, and not the exception, I think that we will avoid confusion by pursuing this course. I have often met, during lactation, with small subcutaneous abscesses, more particularly in the areola, which evidently did not in any way affect the gland; but such do not by any means deserve the name of "mammary abscess."

In frequency of occurrence, the abscesses arising from these varieties of inflammation may thus be arranged:

1st. The subcutaneous abscess.

2d. The interlobular “

3d. The submammary “

Causes of Mammitis.—As the causes, symptoms, and treatment of these three varieties of mammitis resemble each other closely, we will proceed to investigate the disease in its different localities as a unit, begging you to remember, however, that a much slighter injury or irritation will suffice for the production of the more superficial varieties than would do for the deeper seated.

The causes of mammitis are:

(a.) Exposure to cold.

(b.) Injury.

(c.) Lactal engorgement, (whether it occur from neglect, inflammation of ducts, or aversion to nursing from sore nipples.)

(d.) Excessive sanguineous congestion, with commencing lactation, (physiological congestion gradually verging into that which is pathological.)

(e.) Inflammatory affections of nipples or skin, as ulceration, eczema, impetigo, erysipelas, &c. How the first, second, fourth, and fifth of these causes may result in mammitis, it is not necessary for us here to inquire, since the same explanation will attach to their influence in producing this inflammation, as it does to their mode of causation in many others of like character.

The third cause, which is probably the most prolific of all as a cause of mammitis, proves effective in this way: The follicles and tubes becoming gorged with milk which is not evacuated, the former enlarge into the form of irregular tumors, press upon the surrounding vessels, prevent perfect venous return, and thus rapidly bring about a parenchymatous engorgement, which may result in abscess. Let me, by a familiar example, illustrate these remarks: You are all acquainted with that disease of the sebaceous follicles of the face and shoulders, called acne simplex, which produces angry “pimples,” as they are called, or pustules as they really are, on the faces of those just arriving at the dignity of a beard; watch one of these through its course, and you will readily trace these steps. First a black speck is seen, which consists of duct enlarged at the exposed end by a mass of sebaceous material which is retained in the unemptied gland. No redness surrounds this; no pain is experienced; and if the gland be squeezed at its base, a small worm-like body, with a black tip, is displaced, and the affair is ended. Should repletion of the sac still continue, however, a roseate circle is observed around the black speck, inflammation has

set in in the surrounding areolar tissue, and the second stage of this miniature disease is at hand. A few days after this, suppuration is fully established, and should the mass now be squeezed, the operator is gratified by the forcible ejection of a plug bathed in pus, which will often fly out with sufficient force to attach itself to the mirror which probably guides his manipulations.

Now this is, *in parvo*, the process of formation of a mammary abscess from lacteal engorgement: *i. e.*, 1st, simple engorgement of the follicles; 2d, inflammation of neighboring areolar; 3d, suppuration and abscess.

One circumstance (which I have so often mentioned to-day) must be borne in mind as constituting a difference, however, between the two inflammations; namely, that in the mammae the resulting inflammation is generally in the superficial areolar tissue, or that dividing the most external of the lobules.

Upon observing that even inflammation of the ducts must result in secondary mammitis before a true abscess can be formed, the student is apt to ask, "Why make a distinction, since the result is the same in both cases?" To such a question I would reply, "Because without doing so we could not get concise and accurate views of the diseases of any organs of the body, and because in the beginning, before one of these pathological conditions has run into, or produced, the other, the treatment of the two will differ." Orchitis may result from epididymitis, and epididymitis from urethritis, or either may arise primarily. Can any reason be given why, *ergo*, all three should be confounded under the name of inflammation of the genitals? Or why, in studying abscess of the testicle as a result of orchitis, we should ignore inflammation of the spermatic cord as a primary cause, which results in abscess by producing this very orchitis? Medical nomenclature is the student's "slough of despond," and from its fettering influences many a practitioner has grown old with indistinct and confused notions of diseased conditions; and with all due respect for so high and worthy an authority as Dr. Watson, I must say that nothing more clearly illustrates the difficulties which surround its improvement than the sight of his endorsement of its non-progressive state by speaking of endocarditis, pericarditis, and carditis, all under the head of "rheumatic carditis," as he does in his work on Practice.

But let me, in the present case, show how much is gained by attention to the true pathology of the states we are studying.

Inflammation of the ducts does not always end in mammitis, even when it progresses to an unfavorable termination; sometimes lymph

is poured out into the tubes by which they are occluded, and such immense distention of the reservoirs occurs from accumulation that a true milk deposit is formed, which may contain quarts of pure lacteal fluid, and which it is necessary to evacuate by puncture. Dr. Willard Parker, of this city, reports a case where three quarts were thus evacuated by a first incision, and three pints by a second one; and Scarpa tells of a still more remarkable one, where the distended breast measured thirty-four inches in circumference, and rested, when the patient sat, upon the corresponding thigh; a trocar being introduced, ten pints of pure milk poured off in a continuous stream. Now, how could you understand this condition, without being acquainted with the distinction as to the origin of mammary inflammation, which has here been made? Not only may milk be thus collected in a cyst-like dilatation of a duct; the watery portions may be absorbed, and a caseous tumor, or "butyrous tumor," (as styled by Gross,) be formed, and under such distention the duct will sometimes rupture, and the distending material be infiltrated into the areolar tissue of the gland.

Pathology of Mammitis.—As I have endeavored to show, no true mammary abscess can occur unless there be inflammation of the areolar tissue of the breasts. Such inflammation progresses through three stages, giving in each the following morbid appearances: If a breast be examined in the first stage, its blood-vessels will be found distended, and gorged with blood; red corpuscles will be discovered packed closely together, and choking their little canals, and a stasis, (marked during life by heat, swelling, redness, and pain,) will be found existing.

Very soon, unless this congestion be relieved, an effusion of lymph takes place into the areolar tissue surrounding these vessels, and instead of having that appearance which gave it, according to early writers, the name of "cellular tissue," it is firm, and cuts like a solid tumor. This constitutes the second stage, or stage of effusion. If this stage be left to itself, very soon suppuration will occur; and if examined in this, its third stage, pus will be seen insinuating itself into the meshes of the areolar tissue, perhaps passing between the ducts and follicles, and often forming sinuous passages throughout the organ. In one point this pus collects, advances towards the surface, distends the skin, gives to the finger the sense of fluctuation, and constitutes the much-dreaded "milk abscess," or "broken breast," the mere mention of which will make your parturient patient shudder with apprehension.

Prognosis of Mammitis.—As you will see by the sequel, I believe

that in many cases this disease may be prevented when threatened; and fortunately, after its first stage is fully established, it may be readily cut short in its course. Nay, more; if proper means are at once adopted, and persisted in, failure, so far from being the rule, will constitute the inglorious exception.

Even when effusion has occurred, and we recognize the presence of the second stage, the prevention of abscess, though more difficult, is still quite possible; the exuded lymph may be taken up, the choked-up currents of the vessels freed from obstruction, and resolution, or return to health, be attained.

When the presence of pus is once ascertained, there is no more room for hope of prevention, for the evil is already upon us, and all that we can do now is to extricate our patient as soon as possible from it, and protect her from its resulting waste of strength.

The prognosis, as regards recovery after the discharge of the purulent collection, is, of course, favorable, but you will be amazed to see to what a degree this disease will sometimes reduce even a strong and healthy woman. Emaciation, extreme debility, night-sweats, hectic fever, and the whole dread train of symptoms which mark phthisis pulmonalis, will in succession appear, until the poor sufferer, worn with pain and bankrupt in hope, will pray for death to relieve what the art of man seems impotent to cure. True, this picture is one of a badly-managed case; it is the story of an unfortunate who has confided in one who is unprepared to give her that aid which his art through a more capable disciple might render; but believe me, that it is not a rare one; that I have seen it several times in this large city; and in evidence of the fact that my coloring is not too high, hear what others have said in describing it. Dr. Ramsbotham says, "If the drain continue for any length of time after the evacuation of the pus, a gradual loss of strength, appetite, and flesh is observable; distressing rigors occur daily; the patient obtains but little refreshing sleep, and is annoyed by profuse nocturnal perspirations; sometimes she is harassed with sickness, more frequently with obstinate diarrhoea." Again, he says, "The body has been known to dwindle to a mere shadow. In some instances, the patient has sunk under the debility induced." Dr. Gilmour, in an Essay in the *Lancet*, says, "I have a patient under my care at present, aged twenty-three, with sinus in one breast of six weeks' duration, who presents all the appearances of a person far advanced in phthisis;" and Benjamin Bell alludes in strong terms to the "pain and misery to the patient in such cases."

A very curious and important result which sometimes follows the

formation of these abscesses, is that exerted upon the brain. Sometimes the patient becomes furiously delirious, and the symptoms lead us to a diagnosis of puerperal mania, when this slight collection of pus is the cause of the mental aberration. The acute observation of Hippocrates did not allow him to overlook this fact, as is clearly seen by the following passage: "*Mulieribus quibuscunque ad mammas sanguis colligitur insaniam significat.*"—(Opera., 1588, tom. i., lib. v., aphorism xl.)

Ramsbotham relates the following case in corroboration of this fact: "I was once sent for to see a woman, on the third or fourth day after delivery, in a state of the most furious delirium that can be conceived, which had come on rather suddenly. She appeared laboring under the most acute phrenitis, and in the most urgent danger. A copious bleeding seemed absolutely indicated, but on examining the breasts, (as should be done in all puerperal diseases,) I found them both very large and tense, and the surface red; fluctuation was distinguishable in each; it was evident that they had both suppurated, and probable that the violent symptoms depended on their condition. They were freely opened, and in less than an hour the patient had recovered her reason."

Symptoms.—In those rare cases in which we see mammitis as a primary disease, it may be differentiated from inflammation of the tubes and follicles by the following signs:

- (a.) There are ordinarily no rigors seen in the beginning.
- (b.) The induration is not so localized.
- (c.) There is much less pain.
- (d.) There is greater tendency to suppuration.
- (e.) * There is more external redness.
- (f.) There is no pain in lactation.
- (g.) There is no obstruction to the lacteal flow.

When, as is generally the case, mammitis is a disease secondary to lacteal engorgement, we have these symptoms in connection with those dependent on that condition.

Means of Preventing Mammary Abscess.—Always make it a rule, in visiting a female who has been recently delivered, to examine the state of the breasts, at each visit, or at any rate, at each visit subsequent to that made on the third day, and previous to that of the ninth.

If trouble is pending, you will generally find evidence of it upon one of these six examinations. When you discover the existence of

* Dewees says just the contrary, but my statement agrees with those of Velpeau, Ramsbotham, and others.

any symptom which presages mammitis, never leave its treatment to the nurse, but take the management of the case into your own hands, and allow of no experiments, no suggestions, no interference, any more than you would if the patient's lung or liver, instead of her breast, were inflamed. Do not underrate the results which may accrue from your neglect; I have seen many a lady who dreaded mammary abscess much more than she did the pains and dangers of parturition.

You will, in the course of practice, too, find many an one who will suffer the penalty of confiding to the empirical treatment of an ignorant, uneducated nurse, (trying, one after another, all the plasters, unguents and lotions which every nurse has found to prove specific in her experience,) until, too late, she informs her physician of her trouble, states with evident surprise that she has been rapidly getting worse under treatment which, in the nurse's hands, had worked such miracles before, and prays him for that relief which it is now out of his power to give, in preventing an abscess which has already formed.

I am careful to guard you upon this point, because many nurses seem to regard the management of the breasts as their especial prerogative, and to believe that while they deferred to the doctor in his proper province, the conduct of the labor, in the cure of the breasts and the baby, his skill is entirely dwarfed by a comparison with theirs. This is not singular, but what strikes me as wonderful is, that many physicians seem to agree with them.

Let me suppose that you are called to a lady who, during her first promenade after confinement, has been caught in a shower, or exposed to a draught of cold air; and who has just after had a chill, followed by febrile action; and that, upon examination, you find a hard, irregular, painful tumor in one of her breasts, that the flow of milk is very much diminished, and that suction produces pain. What indications would present themselves for fulfillment regarding this, as you would do, as an example of inflammation of the tubes and follicles; of the gland-structure proper?

They would be, 1st. To quiet the catarrh, which has affected the ducts and follicles.

2d. To prevent accumulation of milk.

3d. To diminish vascular supply to the breasts, and equalize and moderate the general circulation.

The first indication may be met by refrigerant applications to the breast, and none has gained so great a popularity as a mixture of vinegar and water. Simple as this is, it answers the purpose admirably; but for it to act as it should do, as an evaporating lotion, it should be

frequently renewed; for even if applied cold, it very soon takes upon itself the characters and functions of a fomentation, rapidly absorbing warmth from the heated breast.

It is really curious to see how this simple prescription, like so many others, has worked its way down to our times from remote periods. Paulus Ægineta "squeezed a soft sponge out of tepid oxycrate, applied to the breasts, and bound it on in a proper form, (Syd. Soc. Ed., Vol. I., p. 504;) Moschion, a cotemporary of Nero, advises vinegar and water; Van Swieten, in his commentaries, speaks highly of Moschion's method; and Dr. Gilmour accuses Dewees of gleanng the hint from these ancient sources, and not accrediting them with the same. I do not myself believe that this answers any better purpose than a cloth soaked in cold water, and repeatedly renewed.

To fulfill the second indication, let the breast be gently rubbed towards the nipple with olive oil, and the follicles be gently squeezed while this is being done, so as to force the imprisoned milk through the tubes, or to stimulate the absorbents to its removal. (Of this method of evacuating the breasts I will speak further anon.) If the milk cannot be thus removed, it must be done by the child, a pump, or, what is still better, by the mouth of the nurse.

For the accomplishment of the third indication, let the bowels be freely acted upon, and the heart's action reduced, by a saline cathartic, combined with a direct sedative; as in the following prescription:

R.—Sulphatis magnesiae, . . .	℥iss.	
Tr. Aconiti radiceis, (Fleming,) . .	℥vi.	
Antimonii et potass. tart., . .	gr. ½.	
Acidi sulphurici arom., . .	℥xxx.	
Aquæ aurantii florum, . .	℥iii.	M.

S.—One-third to be taken every three hours, until the bowels are freely acted upon.

This treatment, continued, if necessary, for two or three days, and the patient being confined to strict diet and allowed very little fluid, will generally meet our expectations.

If the case has commenced as one of mammitis, or if that condition has superadded itself to the last, the treatment should differ somewhat. As a primary disease, however, I believe that you will rarely meet with mammitis; it is almost always secondary to the condition just mentioned, to lacteal engorgement, or to some other. Should it be found to exist either as a primary or secondary affection, the indications, although very similar to those in the last case, will be best accomplished by other means.

A number of leeches should be applied to the breast, or just below it, the bleeding from their bites freely encouraged, and after their removal, a cold saturnine lotion applied, which should be carefully renewed whenever it becomes warm.

I am not in the habit of recommending to you special prescriptions, and that which I subjoin as a local application, I do not insist upon at all, but merely offer it as an example of the class which will be appropriate. The indication is the important point, and if you know of any better means of fulfilling it, employ them.

R.—Acetat. plumbi,	3i.	
Tr. opii acetat.,	3ii.	
Aceti,		
Aquæ,	aa 3vii.	M.

To be applied cold, and renewed whenever it becomes warm.

The bowels should then be freely moved by the prescription given, or any other which may be preferred, and a febrifuge and refrigerant employed—such, for instance, as the following:

R.—Potassæ nitratis,	3ii.	
Antimonii et potass. tart.,	gr. i.	
Tr. verat. viride,	ml.	
Aquæ,	3iii.	M.

A dessert-spoonful every three hours while there is fever.

In addition to this, the milk should be carefully drawn by suction, or a pump. While in the case of inflammation of the ducts, rubbing will be better than suction for the evacuation of the milk, here the latter will be found far preferable to the former, which is liable to injure the areolar tissue, which is already in a state of disease. And last, (but not least,) do not let the inflamed organ hang and drag upon that very tissue which is the seat of the inflammation, for its support; but pass a broad band of adhesive plaster beneath it, and carry it up over the shoulders, to act as a sling. A handkerchief will answer the same purpose, but not near as perfectly. This last direction is one of no slight importance.

So much, at present, for the management of a commencing case of mammitis; that is, of a case in the first stage of inflammation. Before proceeding to speak of the treatment of its second and third stages, it is my desire to draw your attention to the treatment of one of its causes, which is of too great frequency and too much importance to be passed unnoticed longer. I allude to lacteal engorgement, occurring as a concomitant of congestion, or as productive of it.

In this condition, if active congestion have not occurred, our chief

aim is to prevent it by prompt measures, for it will soon appear if not thus warded off.

The indications presenting themselves in such a state are:

- 1st. To evacuate the distended follicles.
- 2nd. To diminish the amount of secretion.
- 3rd. To lessen vascular supply to the breasts.

As soon as you recognize the state of lacteal engorgement, attend to the first indication by having the breasts drawn by the child, a pump, or the nurse, and having them well rubbed towards the nipple, the hands being covered with olive oil or glycerine. The oil is used merely to facilitate the rubbing, and not for any specific action of its own; therefore, do not use oil medicated with camphor or any other substance, which may bring out a very disagreeable eruption, render the child averse to taking the nipple, and make the application of leeches, which we may subsequently wish to apply, almost impossible, on account of their repugnance to the medicinal substance used. The rubbing should be practiced for fifteen minutes out of every two or three hours, should the breasts fill in that time; and although at first painful and disagreeable to the patient, it will soon be asked for, and relied upon by her, as a means of relief.

But its practice requires some skill, and a great deal of gentleness and perseverance. You will often have to explain its *modus agendi* to the nurse, and if necessary will do well on the first occasion to perform it yourself. After rubbing for ten minutes sometimes, you will see no flow of milk follow, but at the end of so long a time will often be gratified by the accomplishment of all you desire.

When practiced as it should be, this is one of the most effectual means with which I am acquainted for preventing abscess from this cause, and in the Dublin Lying-in Hospital is (or rather was in 1853) relied upon almost to the exclusion of all other local means.

At this time, that is, before any inflammatory action has been set up in the areolar tissue or follicles, and when simple lacteal engorgement exists, warm applications should be made to the breasts, one of the best of which is a sponge or bit of linen, soaked in warm water and covered by a cap of oil silk, made to fit the breast.

But you may ask, Why apply cold in the two diseased states just mentioned, and warmth here? The reason is this: in the first stage of inflammation the vessels are dilating and becoming choked with blood, and you should do all in your power to brace them up, give them tone, and prevent the morbid process. Here, however, you have no such state; you wish simply to soothe the tense organ, and to relax

any contraction which may exist in the milk-ducts. It is a fact well recognized by anatomists that the milk-ducts, at their termination in the nipple, are surrounded by contractile or dartoid fibres, and it is highly probable that these, under irritant influences, spasmodically contract, and prevent the escape of milk. The American editor of Ramsbotham's System of Obstetrics expresses such a view on p. 481 of that work, and I have seen several things which lead me to the same belief. Now, warmth relaxes this and any other vital contraction which may exist in these ducts, and thus favors excretion.

To fulfill the second indication, viz., the diminution of the secretion of the breast, act freely upon the alimentary canal, restrict the diet, give little fluid, employ antigalactics, and resort to compression of the gland.

The two first of these methods for producing the desired end are very valuable ones, but will require no further allusion than that which has already been made to them in this lecture, and we proceed to consider at once those antigalactics upon which we can rely. The first is iodide of potassium, given in full dose; the second is the extract of belladonna painted around the nipple. These two remedies have found great favor with the vast majority of those who have tried them, and although I have seen them both fail in checking or even in diminishing the secretion, I have much oftener in my own practice observed that benefit resulted from their use. I therefore advise you to treasure them in your memories, as means which will prove most serviceable in time of need.

The third indication will be fulfilled by means already mentioned in the treatment of the first stage.

Do all these means ever fail when properly and perseveringly applied; and does the obstetrician ever see his best-directed efforts end in disappointment? I regret to answer in the affirmative, but at the same time express the belief that such failures will be very rare, unless he has to deal with a very unmanageable patient, or with a case which had advanced before he saw it to the second stage of mammitis. Should this stage have arrived, however, before the case came under his care, or in spite of his efforts to ward it off by checking the first stage at its inception, he is by no means without resources which may result in prevention of the third stage, which is the greatest misfortune that he fears under the circumstances.

Treatment of the Second Stage of Mammitis.—The second stage of mammitis consists in an effusion of lymph into the areolar tissue of the mamma; may be recognized by great hardness, pain, tumefaction, red-

ness and heat, and may well be dreaded as the precursor of abscess, unless its progress is checked and suppuration prevented.

All those means which have been detailed as applicable to the disease in its first stage, are to be persevered in in this; but should we find that, in spite of them, the case progresses steadily towards the dreaded result of abscess, no time should be lost, but pressure should be established, with a well-founded hope of successful prevention.

It is now about fifteen years since Trousseau and Contour published an essay on the treatment of mammary abscess, by compression, bringing the subject prominently before the profession. It was not original with them, however, for according to Dr. Jas. Gilmour, of Liverpool, in an excellent article on this subject in the *Lancet*, already alluded to, it may be traced to Heister, and its use may be found alluded to in the works of Pearson, Smellie, and Cooper. In this city I know of no one who has so systematically resorted to this means as Dr. S. Conant Foster, who published an excellent article upon it some four years ago in the *New York Journal of Medicine*.

In obstinate lacteal engorgements it is very serviceable; even after pus has begun to form, it relieves pain, and although it does not prevent the coming abscess, seems to prevent the passage of the pyogenic process to larger parts of the organ; but in the second stage of mammitis, where engorgement is ending in effusion of lymph, it is certainly one of the greatest boons with which either patient or accoucheur could meet.

I have myself repeatedly employed it, and never without being not only pleased, but surprised by its results. Equable pressure overcomes the tendency to congestion, keeps the distended follicles closed, and stimulates the absorbents to great activity. Do not let any theoretical objections prevent you from employing this means, and believe me that you will find it one of the most precious resources which you can bring to your aid.

The means by which pressure is best effected is by adhesive straps from 15 to 16 inches in length, and from one to two inches broad. Suppose, by way of illustration, that the right breast is to be compressed, let the end of the first strip be fixed in the right axilla, and then being drawn tight, let it be carried over the lower border of the breast, and its other end attached to the lower border of the breast on the other side. Then let the second strip be fixed at the upper border of the left breast, and this being firmly drawn over the lower border of the right, or diseased breast, let it be fixed so that its lower

end will be attached to the right side, about three inches below the origin of the first.

These two strips should be longer and wider than those which are to follow, for they are to give support to the organ. Shorter strips may follow these, crossing each other as these have done, until the entire breast is shingled over, as it were, with the compressing covering. The particular arrangement, however, is a matter of secondary importance, as the ingenuity of any one will be sufficient to teach him how to accomplish the desired end. Compress the breast as you like, the principle is what I wish to inculcate. Should you desire a more powerful compressing agent than the straps, a most excellent one is offered you in compressed sponge, as recommended by Dr. Batchelder. Having compressed a piece of sponge by heavy weights, place it on the breast, apply firmly a roller bandage, and through this wet the sponge. Absorbing water, it will soon swell, and give you a powerful, safe, and equable means of compression. By this very ingenious means the hardest tumors will disappear, and the breast be rapidly reduced in its dimensions. The sponges employed may be small and numerous, compressing the different parts of the organ which require such treatment; or one large disk of sponge may be prepared, with a hole for the nipple, which will act upon the entire organ at once.

This was the method employed by Dr. Foster in the cases related in the paper alluded to.

You will often find, in a few hours after pressure has been applied, that a tumid, hot, and painful breast will change its aspect most essentially; and even while the straps, or sponge and bandage, are performing their function, the milk can be drawn by suction, the nipple being of course left uncovered; and the adoption of the plan does not prevent the continuance of other means, as saline cathartics, antigalactis, dieting, &c. Pressure, indeed, only takes the place of friction, which has failed us, or which we cannot employ, from the restiveness of our patient, or the pain which it induces after mammitis has been alighted.

When pus has formed, nothing more can be done than to encourage its discharge, and for this purpose a soft poultice should be applied. So soon as the abscess shows a tendency to point, let it be evacuated, and then let the whole breast be supported by strapping, only a space around the opening being left free for the application of a small and light poultice. The straps, now applied, will prevent the formation of sinuses, will force out all the contents of the abscess, and cause a rapid absorption of surrounding effusion.

Should obstinate sinuses have formed, which will not yield to the means mentioned, let them be dilated by sponge-tents, injected with dilute Tr. of iodine, or with simple warm water, and firmly compressed by means of compressed sponge and a roller bandage.

In reference to these and other chronic purulent discharges from the breasts, I must guard you against the prolonged use of poultices. Like other very useful means, they are often abused; and if persevered in after the proper time, will tend to weaken the diseased tissues, and encourage the continuance of the exhausting discharge.

In the medical journals of the day you will see many kinds of treatment extolled, and the proof of their efficacy which will be adduced will be the fact of their having prevented mammary abscess in women who have been delivered of still-born children, and have not nursed. Now, this reasoning is fallacious, for it is very rare that abscess occurs in such cases, and the prevention is entirely imaginary; the appearances of threatened abscess having vanished "*post hoc*," but not "*propter hoc*." I have never seen an abscess of this kind occur in a woman who had not nursed, although I know that they sometimes do so.

In concluding, I will give you a *résumé* of the means to be adopted for the checking of a *commencing* mammitis, without which no abscess can form, but which is very sure to appear as a secondary result of uncontrolled lacteal and sanguineous engorgement.

1st. Evacuate the inflamed breast by the breast-pump, or by suction by the child or nurse, the last being decidedly the best method.

2d. Diminish vascular supply, by saline cathartics, nauseants, direct sedatives, topical bleeding, and cold applications.

3d. Diminish lacteal secretion by strict diet and antigalactics.

4th. Aid in the accomplishment of all these ends, and at the same time cause an absorption of effused lymph and serum, by firm and equable compression.

5th. Never let the inflamed organ hang, but always support it by means of a long and broad band of adhesive plaster passing nearly around the body, and thence under the breast.

6th. Avoid poultices and warm fomentations.

The Physiology of the Circulation. A Course of Lectures delivered at the College of Physicians and Surgeons, New York, in the Fall Term of 1859. By JOHN C. DALTON, JR., M.D., Professor of Physiology and Microscopic Anatomy.

LECTURE VIII.

(OCTOBER 4.)

Endosmosis and Exosmosis—Experiment with Endosmometer—Circumstances Regulating Endosmosis—Condition of the Membrane—Constitution of the Liquids—Position of the Membrane—Temperature—Pressure—Endosmosis of Water towards Albumen—Experiment—Nature of Endosmosis—Effect of Renovation of Liquids by a Current—Experiment—Absorption of Liquids from Areolar Tissue—Effect of Stopping Circulation—Experiment—Exudation of Ingredients of the Blood—In Health—In Disease—Rapidity of Endosmosis and Transudation in Living Animals—Experiment—Absorption and Elimination of Poisonous and Medicinal Substances.

Heretofore, gentlemen, we have been occupied with the physical and mechanical functions performed by the circulatory apparatus. We have studied the movements of the heart, the texture and properties of the vessels, and the motion of the circulating current in different parts of the vascular system. We now approach, however, a different order of phenomena—those which are more purely physiological in their nature, and which are at least equally important with the others, in the part which they play in the vital processes of nutrition.

We shall begin to-day with the study of those curious phenomena, exhibited by the animal tissues, which are known as *endosmosis* and *exosmosis*.

These phenomena depend upon the property of two different liquids which are separated by an animal membrane, of passing through its substance, and mingling with each other in certain proportions.

If we take, for example, a solution of salt and an equal quantity of distilled water, and inclose them in a glass vessel with a fresh animal membrane stretched between, so that there is no direct communication from one liquid to the other, the two liquids being in contact with opposite sides of the membrane, it is found after a while that the liquids have become mixed, to a certain extent, with each other. A part of the salt will have passed into the distilled water, giving it a saline taste; and a part of the water will have passed into the saline solution, making it more dilute than before. If the quantities of the two liquids, which have become so transferred, be measured, it will be found that a comparatively large quantity of the water has passed into the saline solution, and a comparatively small quantity of the saline

solution has passed out into the water. This abundant passage of the water, through the membrane, to the salt, is called *endosmosis*; and the more scanty passage of the salt outward to the water is called *exosmosis*.

It is evident, therefore, that the animal membrane has not prevented the mixture of the two fluids. It may even be seen, by further examination, that it actually causes the mixture to take place.

I have just said that when the water and the solution of salt are placed in contact with an animal membrane and pass through it, the water passes inward to the salt more rapidly than the salt passes outward to the water. The consequence is, that an accumulation soon begins to show itself on the side of the salt. The saline solution is increased in volume and diluted, while the water is diminished in volume, and acquires a saline ingredient.

This accumulation of fluid on one side of the membrane takes place with many other substances when used for a similar experiment.

Here, for example, is an apparatus which will show both the passage of a liquid by endosmosis through an animal membrane, and its accumulation on the opposite side.

It consists of a glass vessel, like an inverted funnel, wide at the bottom and narrow at the top. The bottom of the vessel is closed by a piece of the mucous membrane of the ox's bladder, which is stretched tightly over its edge and secured by a ligature. From the top there rises a very narrow, upright glass tube, several inches in height, and curved over at its upper extremity, so that its orifice points downward.

Three hours ago this vessel was filled with a strong solution of sugar, up to the commencement of the upright tube, and then placed, with its wide extremity downward, in a vase of distilled water, the membrane being supported in a horizontal position by a perforated metallic plate.

Since then, the water has been constantly passing by endosmosis, through the membrane, into the endosmometer. The level of the saccharine solution has gradually risen in the upright tube, until it has filled its entire length, and is now, you observe, constantly dripping from its superior extremity. A certain amount of the sugar has also passed out into the water, but this is in such small quantity, comparatively speaking, that an incessant accumulation has taken place, on the inside of the membranous septum.

As the saccharine solution, therefore, is much heavier than the water, the action of endosmosis has caused this accumulation to take place against the force of gravity, and has raised a column of the denser fluid several inches above its former level.

As the saccharine solution also continues to drop from the end of the upright tube back again into the vase of water, a steady circulation of fluid is kept up by the same force. The water still passes through the membrane, and accumulates in the endosmometer; but as this is already full of fluid, the surplus immediately falls back into the outside vase, and thus a current is established, which will go on until the two liquids have become intimately mingled.

Now, there are various conditions that influence the extent and rapidity with which this phenomenon of endosmosis takes place.

The first is the *freshness of the membrane itself*. This is an indispensable requisite for the success of the experiment. A membrane that has been dried and moistened again, or one that has begun to putrefy, will not produce the desired effect. It has been found that if the membrane of the endosmometer be allowed to remain and soak in the fluids, after the column has risen to a certain height in the upright tube, it begins to descend as soon as putrefaction commences, and the two liquids finally sink again to the same level.

The next condition is the *extent of contact* between the membrane and the two liquids. The greater the extent of this contact, the more rapid and forcible is the current of endosmosis. An endosmometer with a wide mouth will produce more effect than with a narrow one, though the volume of the liquid contained in it be the same in both instances. The action takes place at the surface of the membrane, and is proportionate to its extent.

Another very important circumstance is the *constitution of the two liquids*, and their relation to each other. As a general thing, if we use water and a saline solution in our experiments, endosmosis is more active, the more concentrated is the solution in the endosmometer. A larger quantity of water will pass inward toward a dense solution than toward one which is already dilute. But the force of endosmosis varies with different fluids, even when they are of the same density. Dutrochet, who has written a great deal that is valuable on this subject, measured the force with which water passed through the mucous membrane of an ox-bladder into different solutions of the same density. He found that the force varies with different substances, as follows:

Endosmosis of water, with a solution of albumen.....	12
“ “ “ sugar.....	11
“ “ “ gum.....	5
“ “ “ gelatine.....	3

The *position of the membrane* also makes a difference. With some fluids, endosmosis is more rapid when the membrane has its mucous

surface in contact with the dense solution, and its dissected surface in contact with the water. With other substances the most favorable position is the reverse. Matteucci found that, in using the mucous membrane of the ox-bladder with water and a solution of sugar, if the mucous surface of the membrane were in contact with the saccharine solution, the liquid rose in the endosmometer between four and five inches. But if the same surface were turned outward toward the water, the column of fluid was less than three inches in height. Different membranes also act with different degrees of force. The effect produced is not the same with the integument of different animals, nor with mucous membranes taken from different parts of the body.

Generally speaking, endosmosis is more active when the *temperature* is moderately elevated. Dutrochet noticed that an endosmometer, containing a solution of gum, absorbed only one volume of water at a temperature of 32° Fahr., but absorbed three volumes at a temperature a little above 90°. Variations of temperature will sometimes even change the direction of the endosmosis altogether, particularly with dilute solutions of hydrochloric acid.

Finally, the *pressure* which is exerted upon the fluids and the membrane favors their endosmosis. Fluids that pass slowly under a low pressure will pass more rapidly with a higher one. Different liquids, too, require different degrees of pressure to make them pass the same membrane. Liebig has measured the pressure required for several different liquids, in order to make them pass through the same membrane. He found that this pressure was:

For alcohol.....	52	inches of mercury.
For oil.....	37	" "
For solution of salt.....	20	" "
For water.....	13	" "

You see, then, that in our own experiment, with the water and solution of sugar, the force of endosmosis was very great. For the pressure of the saccharine solution upon the upper surface of the membrane was much greater than that of the water below; and yet the water passed through the membrane against this pressure, and accumulated on its upper surface.

There are some cases in which endosmosis takes place without being accompanied by exosmosis. This occurs, for example, when we use water and albumen as the two liquids. For while water freely passes in through the animal membrane, the albumen does not pass out. Here is an egg, with an opening made in the large end of the shell by

which the shell-membrane is exposed. Half an hour ago the egg was placed in a goblet of water, and endosmosis has taken place to such an extent that you now see the shell-membrane distended, and protruding from the opening in the shell. The water has passed into the egg and diluted the albumen, but there is no albumen in the water of the goblet, which retains its clear and transparent appearance. The membrane, therefore, has allowed the water to mix with the albumen in the egg, but has not allowed the albumen to mix with the water in the goblet.

An hour or two later, the accumulation in the egg would have increased to such an extent that the shell-membrane would have been ruptured by its own distention.

This has actually happened in these two other specimens, which have remained longer in water than the first. Here, you see, the shell-membrane has given way, and the albumen and the water are now mingled in the glass vessel.

Now, gentlemen, we have gone through with the principal phenomena of endosmosis, and have studied the most important conditions which regulate its action. In the next place, let us see what is the nature of this process, and what are the essential properties upon which it depends.

In the first place, endosmosis is not a phenomenon dependent on the simple force of diffusion or admixture of two different liquids.

It is true that the two liquids become mingled together in all the examples of endosmosis which I have mentioned. The activity of this mixture, even, depends very much, as I stated before, upon the difference in constitution of the two liquids. With water and a saline solution, for instance, the stronger the solution of salt, the more rapid is the endosmosis of the water. And if two solutions of salt be used, with a membranous septum between them, endosmosis takes place from the weaker solution to the stronger, and is proportionate in activity to the difference in their densities. From this fact, Dutrochet was at first led to believe that the direction of endosmosis was determined by the difference in density of the two liquids, and that the current of accumulation was always directed from the weaker liquid to the denser. But we now know that this is not the case. For though, with solutions of salt, sugar, and the like, the current of endosmosis is from the lighter to the denser liquid; in other instances, it is the reverse. With water and alcohol, for example, endosmosis takes place, not from the alcohol to the water, but from the water to the alcohol; that is, from the denser liquid to the lighter.

The difference in density of the liquids, therefore, is not the only condition which regulates the direction of the endosmotic current.

The truth is, the process of endosmosis does not depend principally upon the attraction of the two liquids for each other, but upon *the attraction of the animal membrane for the two liquids*. The membrane is not a passive filter through which the liquids mingle, but it is the active agent which determines their passage. The membrane has the power of absorbing liquids, and of taking them up into its own substance. This power of absorption, flowing to the membrane, depends upon the organic or albuminous substance of which it is composed; and, with different animal substances, the power of absorption is different. The tissue of cartilage, for example, will absorb more water, weight for weight, than that of the tendons; and the tissue of the cornea will absorb nearly twice as much as that of cartilage.

Beside, the power of absorption of an animal membrane is different for different liquids. Nearly all animal membranes absorb pure water more freely than a solution of salt. If a membrane, partly dried, be placed in a saturated saline solution, it will absorb the water in larger proportion than the salt, and a part of the salt will, therefore, be deposited in the form of crystals on the surface of the membrane.

Oily matters, on the other hand, are usually absorbed less readily than either water or saline solutions.

Chevreuil has investigated the absorbent power of different animal substances for different liquids, by taking definite quantities of the animal substance and immersing for twenty-four hours in the different liquids. At the end of that time, the substance was removed and weighed. Its increase in weight showed the quantity of liquid which it had absorbed. The results which were obtained are given in the following table:

		Water.	Saline Solution.	Oil.
100 parts of Cartilage,		231 parts.	125 parts.	
" Tendon,	} absorb in 24 hours,	178 "	114 "	8.6 parts.
" Elastic Ligament,		148 "	80 "	7.2 "
" Cornea,		461 "	370 "	9.1 "
" Cartilaginous Ligament,		319 "		3.2 "
" Dried Fibrin,		301 "	154 "	

You see, therefore, that the same substance will take up different quantities of water, saline solutions, and oil.

Now, when an animal membrane is placed in contact with two different liquids, it absorbs one of them more abundantly than the other; and that which is absorbed in greatest quantity is also diffused most abundantly into the liquid on the opposite side of the membrane. A rapid endosmosis takes place in one direction, and a slow exosmosis

in the other. Consequently, the least absorbable fluid increases in volume by the constant admixture of that which is taken up more rapidly.

In our experiments, therefore, an accumulation of fluid took place in the endosmometer, because the animal membrane absorbed the water in greater abundance than the saccharine solution.

But in such an apparatus as this, though endosmosis begins rapidly, it soon becomes less active. For the longer it is in operation, the more the saccharine solution is diluted by the addition of water, and the water in the outside vase also becomes saccharine by the exosmosis of sugar. After a time, therefore, the two liquids become completely mingled, and similar to each other on both sides of the membrane. Then, of course, the process comes to an end.

Now, if by any means we could renew the water in the outside vase, and keep it constantly pure, endosmosis would go on for a longer time, and with more uniform rapidity. The effect would be still farther heightened if we were to renew the saccharine solution at the same time, and keep it constantly concentrated. This might be done by establishing a current on one or both sides of the membrane, so that as fast as either fluid became contaminated by admixture with the other, it would be carried away by the stream, and replaced by a fresh supply. Then, endosmosis would go on with undiminished vigor, so long as the membrane retained its absorbent powers.

It is for this reason a current or continuous movement of the fluids favors the process of endosmosis.

The effect of such a current may be seen very well in this apparatus, which is similar to that employed by Matteucci for the same purpose. I have here a jar, or reservoir of water, with an opening and stopcock at the bottom. To the stopcock is attached a long membranous tube, (the mucous membrane of the rabbit's intestine,) which rests in a shallow vase, with its lower extremity hanging over the edge. On opening the stopcock, the water passes through the intestine from the reservoir, and runs from its lower extremity. By receiving the water as it runs from the intestine, in a goblet containing a solution of litmus, you see that the solution is only diluted, and not changed in color.

I now pour into the shallow vase, outside the intestine, water acidulated with hydrochloric acid. The acid passes by endosmosis through the walls of the intestine, to its interior; and, the endosmosis being hastened by the current of running water in the intestine, this imme-

diately begins to show an acid reaction, for you see it already reddens the solution of litmus in a very perceptible manner.

The hydrochloric acid, therefore, passed at once through the membranous walls of the intestine, and ran from its lower extremity with the stream of water.

Now, it is on this account that absorption takes place so freely and rapidly in the living body. For here, absorption is performed principally with the assistance of the blood-vessels and the circulating blood. All the tissues, it is true, take part in it, and are more or less permeable to watery and serous fluids. But wherever the blood-vessels ramify, and the blood circulates, the vessels immediately give up the fluids, which they absorb, to the blood, and the circulating current at once carries them away to distant parts of the system, allowing an equally active absorption of the remainder. The rapidity of absorption, therefore, depends very much on the condition of the circulation. Where the vessels are abundant, and the circulation rapid, absorption takes place quickly. Where the vessels are scanty and the movement of the blood sluggish, absorption is performed slowly.

If the circulation be altogether arrested in any part of the body, absorption in that part may be entirely suspended, or at least, may take place so slowly as not to produce any visible effect.

This effect may be seen, for example, in the very different rapidity with which certain poisons are absorbed when the circulation is going on, and when it is suspended.

I have here two rabbits of the same size and vigor, and of similar external appearance. In one of them, I have already exposed the blood-vessels of the left hind leg, and placed a ligature loosely around them. I will now draw the ligature tightly round the vessels—both arteries and veins—so as to stop the circulation entirely in this limb, while it goes on as usual in other parts of the body. I now make an opening in the skin, and by the aid of a small syringe, inject into the subcutaneous areolar tissue of this leg a small quantity of the extract of *nux vomica*, dissolved in water. Afterward, the orifice in the skin is tied, so that the injected fluid may not escape.

I now make a similar opening in the hind leg of the other rabbit, and inject the same quantity of the solution of *nux vomica*. We will now let the two animals remain, and see which of them is affected first.

In the mean time, I will say a word or two as to the *mechanism* by which a fluid, in endosmosis, passes through an animal membrane. Understand, if you please, that this process has nothing to do with capillary attraction, or “capillarity.” It is true, that fluids are taken up by

the force of capillary attraction, by narrow tubes, by finely-powdered glass or sand, and by nearly all spongy or porous bodies. But this kind of absorption is only a mechanical adhesion of the fluid to the walls of minute tubes and cavities. The fluid is simply entangled in the meshes of the porous body. In the case of animal membranes, however, the force with which they imbibe watery fluids is of quite a different nature. Here, the fluid penetrates the tissue of the membrane by a kind of chemical combination. It unites, molecule by molecule, with the substance by which it is composed, so that the water, after it has been imbibed by a membrane, actually forms a part of its texture, and is in a state of intimate union with its other ingredients.

It is in this way that all absorption and exudation take place through animal membranes. The old anatomists had no idea of such a process as this. They imagined that the absorbed fluids were taken up by the "open mouths" of absorbent vessels, and that exhalation was also accomplished by the "open mouths" of exhalent vessels. Nobody ever saw these open mouths of the exhalent and absorbent vessels; for, in fact, they had no existence. The vascular system is everywhere a closed circuit. But the anatomists in former times took it for granted that there were such, merely because they could not understand how a fluid could penetrate a membrane except by means of open orifices.

Now, we know that there are no openings in the walls of the vessels, nor in the substance of the tissues, which are visible to the microscope. We have no reason for thinking that the tissues are "porous," or that they can act upon fluids by capillary attraction. On the contrary, absorption takes place with tissues which are homogeneous, like cartilage, as well as those which are fibrous or laminated in structure. It is the animal substance of which the tissues are composed which absorbs the water in endosmosis. The albuminoid substances all possess this property in an eminent degree. The water in absorption is condensed by the solid albuminoid ingredients of the tissue, just as solid substances themselves may be dissolved and liquefied by water. The watery fluids, therefore, which pass into and through a membrane are for the time intimately united with its substance, and are not simply entangled in the meshes of a fibrous network.

Now, gentlemen, you see that the second rabbit, which was inoculated with nux vomica, suddenly shows symptoms of poisoning. The poison has been taken up by absorption by the blood-vessels, and has

at last accumulated in the circulation so as to produce its specific effects. The animal is already in violent convulsions, and will probably die in from half a minute to a minute. The lips and tongue are pallid and purple, showing the suspension of respiration. Now, the rigidity of the limbs is passing off, and the muscles relax; but respiration, you see, does not recommence. The pupil is dilated. The animal is dead. But the first rabbit, which was inoculated before the others, does not yet show the least sign of poisoning. No doubt the poison is absorbed in this animal also. It is imbibed by the tissues of the leg, and by the lymphatics, and may even thus find its way at last into the circulatory system. But owing to the ligature of the vessels and the stoppage of the local current, it is taken up very slowly; and as fast as it gains entrance into the blood it is used up and destroyed in the general circulation.

In an animal, therefore, when the blood-vessels of a limb have been tied, the poison which is injected into the part is taken up piecemeal, and is immediately decomposed, so that no visible effect is produced. But if the movement of the blood be going on, the poison is absorbed so rapidly that it soon accumulates in the blood, and destroys the life of the animal.

It is in this way, gentlemen, that all absorption in the living body takes place. The fluids which bathe the mucous membranes, or which are infiltrated into the tissues, pass by endosmosis through the walls of the vessels, and enter the current of the circulating blood. In many instances, they may afterward be detected in the blood by chemical tests. In others, they act upon particular organs, to which they are carried by the current of the circulation. The larger the absorbing surface, therefore, the more rapidly absorption is accomplished; in the same way as in experiments with an endosmometer, endosmosis occurs more rapidly the greater the extent of contact between the fluids and the animal membrane.

The same thing is true of exudation as of absorption. For in exudation, the fluids pass out by exosmosis through the walls of the vessels; and their passage is subject to the same conditions as when they transude in a contrary direction.

I have already stated that albumen is not endosmotic. That is, it does not transude through animal membranes, though water or other fluids may pass freely either inward or outward. In the circulation, accordingly, we find that the blood-vessels are full of a highly albuminous liquid, which passes to all regions of the body in the movement of the blood. But this albumen does not transude through the vessels,

and is not to be found, in a state of health, in any of the secreted or excreted fluids. It is retained in the circulation, while various other of the ingredients of the blood, such as water, saline matters, &c., are constantly exhaled, and discharged with the secretions.

The phenomena of endosmosis and exosmosis, however, as we have seen, are regulated, to a very great extent, by the pressure which is exerted upon the liquids and the membrane. A substance which passes but slowly under a low pressure, may pass much more rapidly if the force be increased. Oil, for example, which is not endosmotic under ordinary circumstances, may be made to transude by a pressure of thirty-seven inches of mercury, or a little more than one atmosphere.

The same thing is true of albumen. Albumen does not pass out through the walls of the vessels under the ordinary pressure of the circulation. But if this pressure be increased by any means, the serous part of the blood may be exuded, and an albuminous liquid will then be exhaled with the secretions, or infiltrated into the tissues.

We often see this, whenever the circulation is impeded by any obstruction to the return of the blood through the veins. If the femoral vein be compressed by a tumor, or constricted by a ligature, or obstructed by the presence of a coagulum, the pressure of the blood in the lower extremity is immediately increased, and serous effusions take place into the areolar tissue of the part. Compression of the renal veins by the pregnant uterus, or by any abdominal tumor, will cause congestion of the kidney and exudation of albumen into the urinary passages. This is undoubtedly the explanation of many cases of temporary albuminuria, occurring in pregnant women. After delivery, the renal veins are relieved from pressure, and the unnatural symptom accordingly disappears.

Beside pressure, too, there are other conditions, you remember, regulating the endosmosis and exosmosis of liquids.

Among the most important is the *physical and chemical constitution* of the liquids on the one hand, and the membrane on the other. Now in certain diseased conditions, either one or both of these suffer an alteration. In inflammation, for example, the nutritive processes are deranged, and as the tissues have no longer their natural constitution, we find that the ingredients of the blood transude in unnatural proportions. Serous and fibrinous exudations take place into the surrounding parts; and the blood, accordingly, becomes impoverished or contaminated by circulating through the vessels of the diseased organ.

So much, gentlemen, for the ordinary phenomena of endosmosis,

and the conditions which regulate and modify them. Now let me call your attention to certain facts which show the rapidity with which endosmosis takes place in the animal tissues.

When carefully investigated, this rapidity is found to be very great. M. Gosselin, of the Academy of Surgery, at Paris, reported, a few years ago, some very important and valuable experiments bearing on this point. Most of them were performed upon the cornea and other tissues of the eyeball, in order to ascertain their absorbent power in the living animal.

M. Gosselin dropped upon the cornea of the left eye of a living rabbit a watery solution of iodide of potassium, ninety grains to the ounce. At the end of seven minutes, he extracted both eyeballs from the animal, and examined first the left and then the right eye, in the following manner: The surfaces of the eyeballs were first washed with acidulated water; and the washings, tested with a solution of starch, presented no trace of the presence of iodine. None of the iodine, therefore, remained adherent to the external surface of the eyeball. The cornea was then detached, dried on both sides with a bit of linen, cut in pieces, bruised, and macerated for a short time, in a capsule with distilled water. This fluid, tested by starch and nitric acid, then showed a distinct blue coloration of iodide of starch.

The crystalline, vitreous body, and iris, of the same eye, examined in the same way, did not give so distinct a reaction. The opposite eye, subjected to similar tests, did not show the least trace of the presence of iodine.

In another experiment, the eye was extracted eleven minutes after the application of the solution of iodine to the conjunctiva. The cornea, aqueous humor, iris, sclerotic, crystalline, and vitreous body, all showed very evident indications of the presence of iodine; while in the opposite eye, no such indications were found in any part.

In these instances, the solution of iodide of potassium had passed, by endosmosis, into the substance of the cornea in seven minutes, and in eleven minutes had penetrated through it into all the textures of the eyeball. In other experiments, the cornea and aqueous humor both contained iodine in six minutes, four minutes, and three minutes after its external application; and in another still, the cornea presented unmistakable indications of its presence at the end of a minute and a half.

Now, in these experiments, it is plain that the iodine actually passed into the deeper portions of the eyeball by imbibition and endosmosis, and was not transported from the conjunctiva by the vessels of the

general circulation; for the tissues of the opposite eye, examined at the same time, showed no trace of its presence.

It is in this way that a solution of belladonna, when dropped upon the conjunctiva, penetrates the cornea, is taken up by the aqueous humor, and acts directly and locally upon the muscular fibres of the iris. For it does not affect the system at large, nor produce any alteration in the eye of the opposite side. M. Gosselin applied a solution of sulphate of atropine to both the eyes of two rabbits. Half an hour afterward, the pupils were dilated. Three-quarters of an hour later, the aqueous humor was collected, by puncturing the cornea with a trocar; and this aqueous humor, dropped upon the left eye of a cat, produced dilatation and immobility of the pupil, on that side, in half an hour. These facts show, therefore, that the aqueous humor of the affected eye actually contains atropine, which it absorbs from without, through the cornea.

But, in these cases, the surfaces with which the fluids were brought in contact were very small in extent. In the natural processes of absorption and exhalation, as they go on in the living body, the rapidity of endosmosis is much greater; for the anatomical relations of the animal fluids and the absorbent membranes are very much more favorable.

Recollect, if you please, the distribution of the blood-vessels on the one hand, and the structure of the glandular organs on the other.

The arteries, by their repeated subdivision and ramification, become increased in number as fast as they are reduced in size; and finally, when they break up into capillaries, the subdivision of the circulating current is excessively minute. It is estimated, as I have already told you, that the united calibre of all the capillaries in the body is some three or four hundred times that of the arteries; so that, in them, a comparatively small quantity of blood is spread out over an enormous space, and brought into contact with a great extent of membranous surface.

At the same time, the follicles and ducts of the glandular organs are almost equally divided and disseminated. Each lobule of a salivary gland, for example, consists of a vast number of minute follicles or sacs, usually not more than $\frac{1}{300}$ of an inch in diameter, terminating in little ducts, which successively unite with each other, until they at last form the excretory tube of the entire gland. The structure of the lung is similar to this in its general plan; and so great is the involution of surface produced by this arrangement, that the whole extent of the pulmonary membrane is usually estimated at not less than

fourteen hundred square feet. It is certainly not less for the secreting glandular organs, in proportion to their size.

Between all these minute follicles and ducts, the blood-vessels penetrate and ramify; and the capillaries and follicles of the gland are thus brought into the most intimate possible relation. At the same time, if we remember that the blood is constantly renovated in the vessels by the current of the circulation, we shall have little difficulty in understanding that the passage of fluids from the gland to the blood-vessels, or from the blood-vessels to the gland, may take place with an almost immeasurable rapidity.

It has been found, for example, that iodide of potassium, when introduced into the blood, passes out by the secreting surface of the salivary glands, almost instantaneously.

In this dog, a silver canula has been inserted into the duct of the left parotid gland. On injecting a little vinegar into the mouth, the secretion of the gland, as you see, is excited, and the saliva runs in drops from the end of the canula. This saliva, when tested with starch and nitric acid, does not, of course, show any trace of the presence of iodine.

I now insert into the jugular vein, which has already been exposed in this animal, the nozzle of a syringe, and inject a little iodide of potassium, in solution in water. The injection is already finished, and the animal does not appear to have suffered any injury. If we now again excite the secretion of the parotid, by injecting vinegar into the mouth, as before, and collect the saliva as it runs from the end of the canula, on the addition of starch and nitric acid, it immediately strikes a distinct blue color, showing the presence of iodine in the saliva.

It is with such rapidity that iodine passes out through the glandular tissue of the parotid, when directly introduced into the blood. If introduced into the alimentary canal, it would require a somewhat longer time to appear in the saliva, for it must then first pass into the blood by endosmosis through the mucous membrane of the intestine, and then out by exosmosis, through the tissue of the parotid gland. Beside, it must accumulate in the blood in certain proportion, before a sufficient quantity can be distributed to the parotid gland, to be detected in the saliva. But there is no doubt that the salt of iodine *begins* to pass into the blood by endosmosis from the intestine, as rapidly as it is exuded by the parotid, when it has accumulated in the requisite proportion.

At all events, iodine makes its appearance very soon in the saliva after having been taken into the alimentary canal. It passes out also

with the perspiration and with the urine, and may be easily detected in all these fluids in any patient who is taking iodine as a remedy.

Many other substances may be found, in the same manner, in the secreted and excreted fluids, after having been taken into the stomach, or applied to the integument. The rapidity of endosmosis may be seen, also, in the operation of certain poisons. As a general rule, poisonous substances require at least several minutes for their operation, unless when introduced directly into the blood. For, as I have already said, though endosmosis *begins* at once, from the mucous membrane of the stomach or intestine, it requires a certain time for an appreciable quantity of the absorbed fluid to enter the vessels. This is because the absorbing surface is limited in extent, and because, also, the absorbed fluid is immediately mingled with the entire mass of the circulating blood, and of course only a small proportion of what has already been taken up reaches the organ upon which it is to act.

But if a poison which acts in small quantity could be at once brought in contact with a large absorbing surface, its effects would be produced almost instantaneously. For it would immediately enter the blood by endosmosis, and would then be at once distributed by the circulation to all parts of the body.

This is the case with those substances which are taken into the lungs in a gaseous condition. For the vaporous substance is then disseminated, by a single inspiration, over the entire surface of the pulmonary membrane, and passes into the blood as readily as the oxygen of the atmospheric air. It is for this reason that ether and chloroform act in a few seconds, when administered by inhalation, while opium, taken into the stomach, requires from half an hour to an hour to produce its specific effects. Hydrocyanic acid, when dropped upon the tongue so that its vapor might be taken into the lungs with the breath, has been known to act on the nervous system in from five to ten seconds.

The exhalation and discharge of vaporous substances take place with the same facility. The patient who has been etherized, for example, recovers consciousness and sensibility in a few seconds after the administration of the ether has been suspended, while the patient who has been narcotized by opium remains for several hours in an unconscious condition.

We have thus seen, gentlemen, how it is that various substances penetrate from without into the circulatory system by imbibition or endosmosis. By a similar process, the ingredients of the blood are exuded, in various portions, through the walls of the vessels and the

substance of the neighboring tissues, and in this manner the constituents of the animal fluids pass and repass through the absorbent and secretory membranes.

The Conditions attending every Attack of Acute Rheumatism. By ALBERT T. WHEELOCK, A.M., M.D., author of Boylston Prize Essay for 1838. Belfast, Maine.

Observations in this regard, continued through twenty years, have convinced me of the entire correctness of the following proposition, viz.: THAT EVERY ACCESS OF ACUTE ARTICULAR RHEUMATISM IS IMMEDIATELY PRECEDED BY A SPECIAL CONDITION OF THE NERVOUS SYSTEM INDUCED BY MENTAL ANXIETY OR THE DEPRESSING PASSIONS. When the body is in this condition, a suppression of the sensible or insensible perspiration having taken place, the result is invariably acute rheumatism. This truth, though a simple one, is, to my mind, startling, and, without egotism, the most important pathological discovery in the present century. This track of investigation is so unusual—that is, the *rationale* of the production of a given disease—that it is not to be expected that it will be admitted without experience similar to mine, easily obtained, however, by inquiries of one's own or others' patients. It seems the more important, inasmuch as a definite cause discovered producing any one disease, affords a valuable stand-point, and an encouragement for similar investigations referring to other diseases.

Nothing of the kind, to my knowledge, had been given by any medical writer in English, and in 1855 opportunity was afforded me of making personal inquiries of several leading physicians in Paris, who stated the same was the case as far as concerned the French or German. My views were then written, and published in the *Gazette Hebdomadaire* for November of that year.

My materials, used in the investigation of the above-stated proposition, are observations of fifty cases of acute articular rheumatism. The patients were sufficiently intelligent, and the inquiries were no doubt unexpected, but at once understood, and their propriety and pertinency admitted. The cases given here, selected not entirely at random, but for the purpose of showing the disease in different aspects, were well marked, attended by fever at the outset, followed by extreme muscular prostration, and continuing generally several months.

OBS. I.—W. L., a clergyman, aged 30, married, was suffering much mental anxiety and depression, in consequence of opposition to him,

and difficulties in his church. At this period he took a severe cold, in consequence of being unexpectedly out late at night, thinly clad. The following day there was a severe attack of acute rheumatism, attended by the usual symptoms, and followed by extreme muscular prostration; disease continuing more than six months.

OBS. II.—G. P., shoemaker, aged 19, an orphan, had by years of industry saved a few hundred dollars, which he was likely to lose in consequence of having lent it to a friend, by a mercantile failure. His anxiety deprived him of appetite and sleep, and, during the several days passed in this manner, he became exposed to a sudden suppression of the perspiration by cold. An attack of acute rheumatism soon followed, with the usual symptoms.

OBS. III.—W. A. O., aged 40, master of vessel, unmarried, while on a voyage from Liverpool to Boston, the latter part of the winter season, was in a gale of wind fifteen days, and during the whole of that time constantly apprehending serious danger to his ship. During the first few days of this stormy and windy period he was much exposed to the weather, and of course very anxious concerning the fate of himself and the crew. At this time he experienced a severe cold, and a few days afterwards was prostrated by an attack of acute rheumatism. On arrival in port, being removed to hospital, he remained some months, and on discharge continued incapable for business several months more.

OBS. IV.—C. A., aged 25, had an intimacy with a near relative, and she had become pregnant by him. Both were well known to a large circle of acquaintance, and in a situation rendering the consequences likely to be disclosed. While under this excitement and anxiety he became exposed to severe cold, rapidly followed by an attack of acute rheumatism; the more serious effects of which lasted several months.

OBS. V.—E. J., nurse, aged 30, unmarried, of much valuable experience in her vocation; was to attend her sister during an approaching confinement; the previous confinements in this case having been unusually critical. Learning by telegraph of a premature confinement in the case, she was extremely anxious to be conveyed there. While under this mental excitement, making unaccustomed exertions to succeed, neglecting her usual precautions, she experienced a sudden suppression of the perspiration, by cold, and suffered a most severe access of acute rheumatism.

OBS. VI.—B. A., clergyman, aged 40, married, nervous, sanguine temperament, bilious habit, of an unusually social disposition, accom-

plished education; happy in domestic relations; lost by sudden death an only child. The affliction produced nervous excitement, amounting to partial insanity. While attending to some customary manual labor during this mental disturbance, he became wet in a shower of rain, and neglecting usual precautions, experienced a severe cold. Acute rheumatism consecutively followed.

OBS. VII.—J. K., farmer, aged 20, married, living in a newly-settled district of land, and making his farm, and laboring every day of the week in order to have his crops sown seasonably, was much troubled in mind in consequence of thus disregarding the Sabbath, having strong conscientious scruples against it. During this time, neglecting usual precautions, in consequence of his mental distraction. A severe cold was the immediate precursor of an attack of acute rheumatism, of five months' duration.

OBS. VIII.—Mr. C., merchant, aged 35, married, contracted gonorrhœa from a woman of the town; while suffering anxiety, in fear of the discovery of his faithlessness by his wife and friends, and attending to customary employment, by some neglect he experienced a severe cold, which was immediately succeeded by an access of acute rheumatism.

OBS. IX.—G. B. M., student in medicine, was candidate for the position of house physician to a hospital, the result of the candidacy to be decided by examination and thesis. Desiring the situation on account of pecuniary necessities, as well as the honor it conferred, he exerted himself very laboriously in his studies for several months, and had much anxiety in regard to the result. As the time of examination approached, succeeding some active physical exertions, he experienced a sudden diminution of the vital heat by cold, which was immediately followed by a lengthened attack of acute rheumatism.

OBS. X.—C. H., jeweler, aged 26, had pursued his occupation successfully for two years in a new and flourishing city, when being obliged to vacate his tenement on account of the sale of the building, he found much difficulty in obtaining another. He spent several days unsuccessfully in inquiring about the place, for that object. He was delicate physically, made more so by his sedentary employment. While exerting himself in this manner, being much depressed and anxious, he became exposed to sudden cold; the consequence being an attack of acute rheumatism, continuing several months, recurrences of which subsequently took place.

OBS. XI.—J. R.; female; age 29; married; amiable and affectionate disposition; unusual sensibility; temperament nervous; had been

for two or three weeks making preparations for an entertainment of numerous friends at her house; quite anxious, as might be expected, for everything to pass well; and during the evening of the entertainment was exposed to a strong draught of air through the opened doors, while receiving her guests. She attended to the duties of hostess, for the evening; the following day, commenced an attack of rheumatism, continuing four months.

OBS. XII.—B. W., a young professional man, aged 24, had an urgent engagement several miles from his residence, and was unjustly disappointed of his expected means of conveyance thither. While very much vexed, and anxious about the consequences of the delay, he went hurriedly to seek another conveyance; and obtaining a carriage, he jumped into it in a state of free perspiration, and drove rapidly off. Next day was the commencement of a severe and lengthened rheumatic fever.

Observations similar to the preceding, made during a series of years, affording no exception to the proposition above enunciated, its converse being equally found true, that no case of acute articular rheumatism has been observed not traceable to excessive mental emotions immediately previous, have settled indubitably, in my opinion, that mental emotions and cold produce with philosophical regularity and mathematical certainty the disease acute rheumatism. The connection between these phenomena is thoroughly proved.

What, then, is an important additional indication in the treatment? It is, of course, to bring into operation the requisite moral influences. The patient is to be made to understand the true nature of the disease and its cause. Though it cannot be expected that every individual shall exercise the force necessary to the forgetting or ignoring mental agitations in these cases, yet it may be presumable that a knowledge of the real producing cause may not only prevent a recurrence of it, but will greatly assist in fortifying the sufferer against its protracted continuance. In my own experience, I have found, when patients are informed that it has been brought on themselves by a mental agitation that might seem to have been avoided or was inexcusable and needless, the disease has been shortened in its course or immediately stopped; and where there had been successive attacks, the patients had thus been apparently spared these recurrences.

Reports of Surgical Cases. By JOHN O. BRONSON, M.D., Professor of Surgery in the New York Preparatory School of Medicine.

No. II.

FOUR CASES OF VESICO-VAGINAL PERFORATIONS.

Case 1.—Cured in one Operation by New and Original Means.—On the 6th of June, 1856, in conjunction with my colleague, Dr. C. A. Budd, I was called in consultation to a case of tedious labor. The labor, which had progressed favorably for a short period, was arrested at an early hour in the day, and at seven in the evening we met in consultation. The position of the fœtus was found to be regular, with the head low down. The vagina lacked moisture, and the external organs were greatly œdematous. It was decided to deliver at once by means of forceps, which was accomplished with care and skill by Dr. Budd. This was the fifth child of which she had been delivered, none of whom were then living, three of them having been still-born and withdrawn by the forceps.

The case was left in the care of the attending physician, who, on the fifth day after, again called me on account of a dribbling of urine, of which the patient complained. I found the vesico-vaginal septum inflamed and sloughing where it had suffered compression between the occiput and pubis. I counseled cleanliness and attention to the general condition of the patient, she being of a delicate constitution, and requiring supporting treatment.

This course was followed, and at the termination of four months the patient was deemed in condition to bear an operation for the cure of the lesion resulting from the sloughing.

Upon thorough examination, the parts were found perfectly cicatrized. The cervix uteri had been involved in the general inflammatory action, and had in great part sloughed away. To the left of the median line, and one inch from the cervix, a perforation of the vesico-vaginal septum existed, measuring one inch and a quarter in its vertical by three-quarters of an inch in its transverse diameters. Its border was quite regular, and in a healthy state. The question of an operation was decided in the affirmative, and I resolved to perform it on the following principles:

Preparation of the border of the opening being the first thing requisite, I deemed a vertical excision as usually practiced not as conducive to success as if the border was cut to a bevel, taking more tissue from the vaginal wall, thus producing a more extensive vivified surface, without really enlarging the opening. I considered other ad-

vantages to attend this manner of operating, as it involved a principle heretofore overlooked or unmentioned.

When the bladder is collapsed, the opposing surfaces, by every motion of the body or its larger members, are chafing the one against the other, and thus forcing the fluid it is constantly receiving into its cavity into any fissure or crevice, which in a state of rest would be wholly impervious.

A familiar illustration of my meaning is seen in a fine-meshed sieve, which will hold a considerable quantity of water if undisturbed, but if chafed even but slightly, by the palm of the hand for instance, the water is forced through rapidly and completely.

By beveling the border of the aperture, when the sides are brought into apposition the vesical edge is in closer contact than the vaginal, and a slight prominence is formed on the vesical side, which counteracts, in part, the influence exerted by the collapse of the organ. Another fact having an important bearing on this operation I have failed to find heretofore considered. I mean the difference of structure between the vaginal and vesical tissues. The strong muscular structure of the bladder greatly preponderates over the weak muscular tissue of the vagina. There is a difference not only in power, but also in function. The muscularity of the vagina is only active under sexual excitement; whereas, the muscular action of the vesica is stimulated by the presence of anything in its cavity. This difference presents an indication which is met in great part by this method of denudation.

Coaptation and maintenance of the lips of the wound in contact, with the exact amount of pressure, was the next subject for consideration.

Rest is a fundamental law of cure, and the more completely it is effected the more successful will be the result after operations upon the vesico-vaginal septum. To overcome direct opposing traction upon the lips of the wound is not all that is sufficient. A sliding of the lips upon one another must be also prevented.

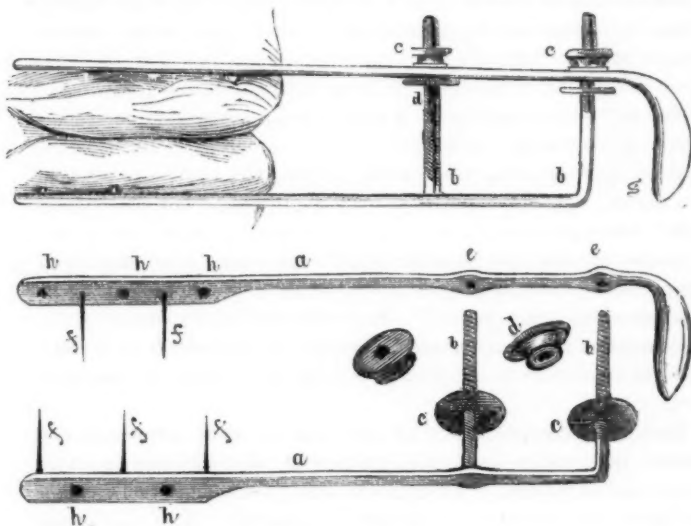
To meet these indications, I devised an instrument which combined the power of preserving perfect rest to the parts implicated, in overcoming both direct and oblique traction, and the advantage of being readily graduated in its pressure, external to the vulva.

Having well considered these matters, I proceeded to carry them into practice.

On the 30th of October, 1856, in the presence of Dr. B. Fordyce Barker, Dr. C. A. Budd, and assisted by Dr. J. H. Douglas, and Mr. Farrington, medical student, I operated on the foregoing principles.

Placing the patient on her knees, with her body flexed forward, and resting upon her shoulders, in the position first recommended and practiced by Wützer, the parts were brought into view by means of the swan-bill speculum or perineal elevator, as also first practiced by him.

First delineating with a sharp-pointed bistoury the extent to which denudation was desired, I proceeded to dissect a continuous strip from the vaginal border of the opening, three-eighths of an inch wide, leaving the vesical tissue barely encroached upon at its extreme edge. This step was readily perfected with bistoury and scissors. All was now ready for the application of the instrument, (see cut,) which was done by inserting the teeth one-half an inch from the edge of the denuded



a, a, Arms of the instrument.

b, b, Pillars threaded to carry the nuts.

c, c, and *d, d*, Which serve to confine the arms in their proper relation, and graduate the pressure.

f, f, f, f, f, f, Teeth, acting the parts of sutures. Opposite each is a hole, marked *h*, to receive the points of the teeth, in case it is necessary to bring the arms nearer to each other than the teeth would otherwise allow.

O, Flange, or process by which the arm to which it is attached can more readily be handled. The pillars, *b, b*, serving the same purpose in the application of the opposite arm.

The instrument is made of steel, and may be electroplated or not, as may be deemed desirable. By use it becomes protoxydized, in which state it remains without further corrosion. It is made by Tiencken, 749 Broadway, Lürer's well-known depot.

surface, and passing them between the vaginal and vesical membranes, and bringing them out at points in the denuded surface one-eighth of an inch from the vesical border. The two parts of the instrument were then approximated, and the lips of the wound brought into close contact, and there retained by means of the thumb-screws, perfectly closing the aperture. A catheter was then introduced and secured in place, and the patient, assuming the recumbent position, was left to rest and await the action of nature.

On the following day, everything was progressing favorably.

On the 1st of November, the second day after the operation, by a misunderstanding on the part of the attendant, the patient was not visited, and on the following day I found that the catheter had been accidentally removed and the vesica was filled to its apparent limit, and yet the parts were impervious. I drew off seventeen ounces of urine, giving the patient great ease.

On the 4th of November, the fifth after the operation, I removed the instrument, and found my fondest hopes realized in complete union of the lips of the wound.

On the 3d of December, having perfect control over urinary action, and able to retain her water as long as ever, she was discharged from further care.

Case 2.—Spontaneous Cure after One Year and Three Months' Duration.—Mrs. M——, native of Ireland, 25 years of age, mother of one child, consulted me in the month of October, 1857, by reason of inability to retain her urine, it being constantly dribbling away. I found upon examination that a perforation of the vesico-vaginal septum existed near the left border of the trigone, about one inch from the neck of the bladder. The opening admitted the passage of a common silver catheter, and had been produced by tedious labor. Operation was proposed and agreed upon, but violent opposition on the part of her husband to anything having the name of *operation* could not be overcome, and it was therefore postponed until after she should have given birth to a child, of which she was then two months pregnant.

On the 22d of May, 1858, she was taken in labor, and after twenty-eight hours, without unusual symptoms, gave birth to a female child. From this time, one year and three months from the birth of her first child, all dribbling ceased, and the patient was well. Upon close inspection of the parts, three weeks afterwards, it was found that union of the two sides of the perforation had occurred, apparently by reason of the pressure of the head of the fœtus occluding the aperture for

the time being, while nature put forth her efforts to permanently close the breach.

Case 3.—Cured in one Operation by New and Original Means.—Mrs. G——, native of Ireland, 32 years of age, was received into the New York Infirmary for Women and Children, Sept. 12th, 1859, giving the following history: She was the mother of three children, all of whom had been delivered with instruments, on account of a contracted pelvis. The last child was born still, in October, 1857, when she was in severe labor forty hours, at the end of which time her attending physician called Dr. A. K. Gardner in consultation, who immediately delivered her with forceps.

On the seventh or eighth day after, urine began to dribble through the vagina, and had continued ever since. Upon examination, a perforation of the vesico-vaginal septum was found to exist about a quarter of an inch from the cervico-vaginal junction, of a size admitting the passage of a uterine sound. Operation was determined upon. On the 14th of September, after thorough evacuation of the bowels, I proceeded as in the aforementioned case, with my patient in the same position. On account of the distance of the opening from the vulva, the successive steps of the operation were attended with some difficulty.

In performing the denudation, the tissue was found to be dense, and of too little vitality to augur well for success; nevertheless, it was finished, and the instrument applied as in the first case. On account of the relation of the parts, however, the instrument was slightly curved, thus allowing of a better adaptation. As in the former case, a catheter was secured in place, a suppository of opium introduced into the rectum, and the patient left to rest.

Dr. George T. Elliot, Dr. E. Blackwell, Dr. Hughes, Dr. Underwood, Dr. Stratton, and Dr. Cushing witnessed, and assisted in the operation.

On the 19th the instrument was removed in the presence of Dr. John Howe and Dr. Hughes, and union was found to be imperfect, although no communication existed between the bladder and vagina.

20th.—A small spot of moisture upon the sheet, yet upon examination no point was ascertainable through which water could have flowed. Nitrate of silver applied to the uncicatrized part, and a catheter passed, to be retained. 21st. Catheter withdrawn. 25th. No abnormal opening into the bladder. The vitality of the parts before mentioned evident in the cicatrization. Nitrate of silver has been occasionally applied, with good effect.

October 30th.—Retains her urine perfectly, and has done so since the 20th, holding it for two hours.

Nov. 2nd.—Bed again wet. No aperture, however, existed, and another cause had to be assigned. It was believed to be inability of the bladder to retain beyond a certain quantity of urine, and that it passed by the urethra.

This solution of the question was supported by the fact, that it never passed during the day, and only those two times at night. Commenced to menstruate.

Nov. 9th.—Perfect control over urinary action; cicatrization complete; discharged cured.

In the month of November I visited her at her home, and found her happy, in the freedom from one of the most, if not the most, serious of all maladies.

Case 4.—Cured in one Operation by means of the Silver Suture.—Mrs. C., native of Ireland, 24 years of age, was received into the N. Y. Infirmary for Women and Children, Oct. 28th, 1859.

She had passed through the terrible ordeal of tedious labor, under the care of that curse of his race, a base pretender, who had blazoned in his window "Physician, Surgeon and Accoucheur," and who, in every medical or surgical act, added to his daily sins that heinous crime of trifling with human life for filthy lucre.

She suffered the galling pains of ineffectual labor for the greater part of two days, when her attendant delivered her by means of instruments, and left the patient without removing the placenta, which remained for twenty-four hours, and then was taken away by a nurse.

As a result of such a state of things, severe inflammation of the pelvic viscera was awakened, producing sloughing of the cervix uteri, of the vesico-vaginal septum, and obliteration of the vagina to within an inch and a half of its ostium, leaving at that point, bounded by unyielding cicatricial tissue, a transverse opening into the bladder, measuring two inches in length by three-quarters of an inch in breadth. The vagina being closed above, in making a digital examination, the finger found immediate entrance into the bladder.

The parts being not perfectly healed, and a very considerable amount of irritation existing, a strong solution of the acetate of lead and opium was prescribed and used for the space of two weeks, with the effect of presenting her fit for an operation. In considering the condition of the parts, I found two of the indications for which my instrument was devised fulfilled by the cicatrix. Motion was destroyed, and there could be no sliding of one edge upon the other, for

bands extended from ischium to ischium, holding them more firmly than any mechanism. It was decided, therefore, to make use of the interrupted suture, as all that was required was simply to maintain the opposing borders in close contact. Accordingly, on the 11th of November, in the presence of Drs. Blackwell, C. K. Briddon, Aigner, C. A. Budd, Hughes, B. L. Budd, Cushing, and a number of pupils, I proceeded to denude the border of the opening, after the manner described in the first case, and applying five sutures of silver wire, I made a very free transverse incision on the posterior side of the wound, to free the parts as much as possible from direct traction. The patient was then arranged as in the preceding cases, and left to await the result.

On the tenth day after the sutures were removed, and although they had produced a considerable amount of ulceration, union was complete, and the patient was able to retain her urine entirely. Two days after she was discharged, cured; a result which I deem to have been based on the manner in which vivification was effected.

79 EAST 18TH STREET.

Lectures on Displacements of the Uterus. By E. R. PEASLEE, M.D., LL.D., Professor of Obstetrics and Diseases of Women and Children, in the New York Medical College.

LECTURE VI.

GENTLEMEN—Retroversion of the unimpregnated uterus requires essentially the same management as retroflexion; but when it occurs during pregnancy, it is a serious, and as we have seen, at length becomes a most dangerous condition, admitting of no delay. I shall first speak of retroversion occurring during gestation, and then of retroflexion of the unimpregnated uterus.

I. TREATMENT OF RETROVERSION OCCURRING DURING PREGNANCY.

The prime indication in the treatment of retroversion (or retroflexion) during pregnancy is, of course, to restore the uterus to its normal position. In some cases, however, some delay is admissible; and in such, the very frequent evacuation of the bladder by the use of the catheter, so that this organ is not allowed to become at all distended, has been known to accomplish the desired object. In eight cases detailed by Dr. Ramsbotham, the uterus gradually righted itself under this treatment alone. Dr. Ingleby also reports a similar case. If the catheter can be constantly worn by the patient, without much irrita-

tion, the same object is accomplished with more convenience to the medical attendant. This result of the means just spoken of, will also be rendered more probable by the daily evacuation of the rectum by copious enemata. It is, however, only while the uterus is still comparatively small—as during the first three months of gestation—that we can expect any success from these means. Drs. Blundel and Duncan advise also to keep the patient for several hours daily on her knees and elbows, with a view to effect the replacement. I should hardly wait to carry this suggestion into operation; but if the former means failed, or if for any reason there should be no delay, I should advise to proceed to replace the uterus by such manipulations as are hereafter to be specified.

The following preliminaries may, however, require consideration before we proceed to reduce the uterus by the taxis, as it is called, *i. e.*, by direct manual interference:

1. *The bladder should be evacuated.* There may be complete retention of the urine, as we have seen, or a constant stillicidium. But in either case—and in all cases in which any derangement of micturition occurs—the catheter should be used. Often the introduction of the instrument is rendered very difficult by the pressure of the neck of the uterus against the urethra, or the neck of the bladder. With a silver male catheter, or one of flexible metal, you may, however, generally effect the object without much difficulty. Some prefer a gum-elastic bougie. If the neck of the uterus can be reached and pressed slightly backward, the catheterism may in some cases be more easily accomplished. If, however, the operation be found impossible, the bladder must be punctured; but I think a necessity for this procedure should but rarely occur.

2. *The rectum should be evacuated.* This is best effected by an enema of Oj. to Oij. of warm soap and water.

3. Some advise to bleed the patient to syncope just before commencing the manipulations necessary to replace the uterus. Dr. Dewees had great confidence in this agent in this class of cases. But I think this will be but seldom found necessary since the discovery of the use of anæsthetics.

4. The question of etherization is also to be considered. If thought necessary, I should use the concentrated sulphuric ether, which I prefer to all other anæsthetics in almost all cases; the exceptions and the reasons I have before given you.

5. *Finally, the patient must be placed in the best position* for the operation of replacement. If pregnancy has not advanced beyond the eighth

or tenth week, the attempt may be made while the patient lies upon the back, with the pelvis raised, as upon a pillow. But if this fails, or if difficulty for any reason is apprehended, the patient should be placed upon the knees and elbows, and while in that position allowed to incline and rest upon the left shoulder instead of the left elbow; the latter change making her position far more easy to be borne, and quite as advantageous. The advantages of this position are: (1) that while thus placed the patient cannot strain or bear down, and thus resist the efforts at replacement; (2) that the atmospheric pressure aids in replacing the uterus, as first observed by Dr. Sims, of this city; and (3) that the body of the womb may be readily reached, if necessary, *per rectum*.

These preliminaries being resorted to, so far as may be required, we may proceed to the operation of reposition. Frequently the uterus may be returned to its normal position by passing the index or the middle finger, or both, into the vagina, and elevating the fundus from its contact with the rectum. Or if the finger is found too short, it may be rendered practically one-half to one inch longer by passing it into a portion, two inches long, of a gum-elastic rectal bougie of the proper size, (made hollow, of course, like the finger of a glove,) and then carrying the finger thus armed into the vagina as before.

If this measure does not succeed, a wire, ten inches long, bent at one extremity into a loop of the proper size, may be carried by the right hand into the vagina, and the loop passed over the cervix, with the intention of drawing it down, while the other hand is elevating the fundus. Churchill suggests the use of a hooked forceps for that purpose. A sound passed into the bladder may also be made to act as a lever upon the uterine neck to depress it. These means may be employed if pregnancy has not advanced beyond the third month, with the patient lying either upon the back or in Dr. Sims' position, before explained. If lying upon the back, she must be instructed not to strain during the operation. But if the uterus is already large, as in the fourth month, the latter position should at once be resorted to. And it is to be expected that the uterus will be replaced *per rectum*, rather than *per vaginam*.

It is a fact of great practical importance, that the whole hand, even, may be passed into the rectum of the male or female adult. The late Mr. Thomas, of London, first ascertained this fact in respect to the male; and Dr. Dusaussais in regard to the female. In some cases, Dr. Parent also succeeded in replacing the uterus only after he had

passed the whole hand into the rectum; and this is in any case to be attempted, if the reduction cannot otherwise be effected.

Having effected the reposition, the patient is to lie for several days (two to three weeks) upon the side, inclining more or less to the prone position, in order to prevent a recurrence of the retroversion. Meantime, the bladder must be constantly kept nearly empty by the use of the catheter; and enemata must be used, as required, to keep the rectum evacuated. Some advise to keep the patient on the knees and elbows for two hours every day, if a relapse is threatened. The time during which a patient is to maintain the recumbent position depends on circumstances. The probability of the recurrence of the displacement is of course greater as pregnancy is less advanced. During the first three months a relapse is very probable; after four months are completed, a relapse is quite improbable. After the uterus is so large that a relapse is out of the question, the patient may take as much exercise as if this difficulty had not occurred at all. During the first two months a ring pessary may be used to retain the uterus after it is replaced, provided there be no congestion or other condition to render it improper; and the patient may be allowed to leave her bed, and perhaps also to walk. But if used, it must be very carefully watched, lest it produce abortion.

We must, however, by no means feel assured that all the symptoms in a severe case will cease as a matter of course when the uterus is returned to its normal position. However carefully the operation may be performed, inflammation may ensue, and in some cases described by Amussat, even fatal metro-peritonitis occurred. Miscarriage also sometimes occurs after the reposition. We are, therefore, to be ready to meet any inflammatory symptoms which may ensue, by the use of leeches, venesection, anodynes, and appropriate regimen, as circumstances may require.

But cases occur in which, from adhesions between the displaced uterus and the contiguous parts, or from other causes, it is found quite impossible by any means to restore the gravid uterus to its normal position. If in such a case the uterus is still small and light, (first or second month of gestation,) a globe pessary $1\frac{1}{2}$ to $2\frac{1}{4}$ inches in diameter, as required, may be introduced into the vagina, if there are no facts in the case to contra-indicate it; and which may gradually elevate the fundus, as it sometimes raises the uterus in prolapsus, (Lec. 4, p. 526.) The instrument is, however, used at the risk of producing abortion. But the latter affords the only chance of life to the patient, provided the uterus cannot otherwise be replaced; and the globe pessary

promises as much as any device in the way of elevating the body of the uterus, if abortion does not occur. Some would use the colpeurynter, or gum-elastic bag introduced while collapsed into the vagina, and then inflated; or the same passed into the rectum and inflated. The former, however, acts on the same principle as the globe pessary, and is more offensive to the patient. It has served to replace the uterus, and has also occasioned abortion. Its application *per rectum*, as first advised by Fouret, I do not recommend. It is, of course, disgusting to the patient and to the practitioner, requires to be removed and reapplied every day or two, and is not more efficient than when applied *per vaginam*.

But suppose that gestation has attained to the fourth or even the fifth month, and it is found impossible to replace the uterus; what is to be done? The only hope of saving the patient is from the induction of premature labor. This is most certainly and most promptly effected by rupturing the membranes, or breaking up the chorion, by the introduction of the uterine sound. And if the bladder be previously evacuated, and the patient be in a standing position, the os can generally be reached with the finger, and the sound passed without much difficulty; though it might not otherwise be possible. It is passed with the concavity looking backward. Or the patient may be in the position specified in the preceding lecture, (p. 26.) If the precise position of the os can be made out, a gum-elastic bougie, or one of flexible metal, may sometimes be passed, though the os cannot be felt with the finger. Or if the sound be found useless, I would use the cold or the warm water douche, *per vaginam*, as recommended and methodized by Prof. Kiwisch, of Würzburg, for the induction of premature labor in cases of contracted pelvis. This failing, I would use the tampon in the vagina, if delay were admissible.

As a last resort to secure the expulsion of its contents from the uterus, the latter may be punctured with a trocar, either from the rectum or the vagina, and the liquor amnii evacuated; after which it may be expected that abortion will occur. This alternative has succeeded, but it is not unattended by danger, since the peritoneum is necessarily punctured in two places.

Gastrotomy has been recommended by Callisen, so that the uterus may thus be replaced by direct manipulation. I should say that unless the patient is in immediate danger, and the various means of inducing premature labor have all failed, the replacement of the uterus being at the same time found impossible, the idea of opening the peritoneal cavity is not to be entertained; and that even in these circum-

stances, but a very few cases will warrant it. So I should also decide that the division of the symphysis pubis, as advised by Gardien and Purcell, is never justifiable. And in regard to gastrotomy, I should add, that sometimes it would be found impossible to replace the uterus even after opening the abdomen. In the case described by Dr. Hunter, the uterus could not be moved from its position and lifted up through the superior strait of the pelvis, although the ossa pubis had been sawn asunder; it had so moulded itself to the surrounding organs.

If abortion occurs either after reposition or in consequence of means used to induce it, the treatment will, of course, depend on the circumstances of each patient.

Finally, if *retroflexion* occur during pregnancy, which I have before asserted is very rare, its treatment is essentially the same as that of retroversion. If the retroversion or retroflexion recurs after parturition, or after abortion, the case, of course, then belongs to the class next to be considered.

II. TREATMENT OF RETROFLEXION OF THE UNIMPREGNATED UTERUS.

Having disposed of the posterior displacements occurring during pregnancy, the more frequent of which by far is retroversion, and which also requires the most prompt and efficient treatment; I now speak of retroflexion (and retroversion, which is far less frequent,) of the non-gravid womb. But I should speak, before entering upon the main subject, of that class of cases which, both from their symptoms and their necessity for prompt treatment, so much resemble those which have just been disposed of; I mean those cases in which the unimpregnated uterus has been suddenly displaced backward, as by a fall, or a violent effort.

Here, of course, the first question is whether the uterus is actually gravid or not. For, unless it be positively decided that it is not so, we are not to attempt to replace it with the sound; while if we can decide negatively, it may be used as in the cases next to be considered. The fact may be a guide in forming our decision, but it is by no means an infallible rule, that retroflexion of the unimpregnated uterus most frequently occurs during or very soon (within three or four days) after menstruation. If, however, in any case there be doubt, it must be treated as belonging to the class of cases just disposed of—as backward displacement during pregnancy.

Excepting the cases just alluded to, retroflexion of the unimpregnated uterus has generally existed for a long time—several months

to several years—before the physician is consulted; and from what I have said under the head of prognosis, you will infer that several months will probably be required for the proper treatment of this displacement. There are instances of retroflexion which produce no symptoms, and therefore require no treatment. Such occur most frequently in women who have had several children, or with whom the child-bearing period has passed. Most cases of retroflexion, however, require both local and general treatment.

I. The *local treatment* is of the first importance; and, as in prolapsus uteri, its indications are threefold:

1. To remove the causes of retroflexion, if possible.
2. To replace the uterus.
3. To maintain it in position.

Some, however, think the local treatment to be of no importance. Dr. West "takes care of the general symptoms, and leaves the displacement to take care of itself." Others, also, resolve the whole local treatment into a very simple matter. Some treat the congestion or ulceration, and leave the rest to nature. Dr. Meigs says in regard to retroversion of the non-gravid womb, "If you intend to cure a woman of retroversion, your intention should have reference rather to the *ligamenta rotunda*, than to the uterus;"* and he would cure it by the use of a globe pessary. But he merely alludes to flexions of the uterus as if very uncommon† and quite unimportant, and confounds them with mere flexions of the cervix.‡ Dr. Peebles asserts that when the vagina is "by any means supported to its proper length and height in the pelvis, displacement will be rectified." He proceeds to infer that Dr. Hodge's pessary, before described to you, is the best; and therefore uses it in "every case of displacement" (of all kinds) "where mechanical support is necessary."§

But you will find no exclusive view of this subject to prove satisfactory in practice. I shall, however, not here controvert the views I have just quoted, but proceed to the treatment I would recommend.

1st. *Indication*.—It is not by any means a general rule to remove the causes of retroflexion before any attempt is made to replace the uterus. Generally, the uterus is to be replaced at once, and the cause,

* Woman and her Diseases, p. 209.

† "When the top of the womb is thrust over backward, the womb does not bend, being somewhat rigid, but it *see-saws*, i. e., the mouth comes forward if the fundus goes backward."—*Woman and her Diseases*, p. 236.

‡ Woman and her Diseases, p. 238-9.

§ *American Journal Medical Sciences*, July, 1853, p. 51.

if still persistent, to be subsequently removed. But this subject should be first considered.

The causes of retroflexion which are capable of being removed are distention of the bladder, constipation, polypus uteri, tight dressing, or too much weight of dress; and increased weight of the uterus from congestion, inflammation, or hypertrophy. Of these, distention of the bladder and rectum are, of course, to be removed before the attempt is made to reduce the uterus. The same is also to be remarked of polypus uteri, and the dress is to be attended to, after reduction, to prevent a return of it. In regard to congestion, inflammation, or hypertrophy, however, I should say that the uterus should first be replaced and retained in place, so far as may be, by a horizontal position and attention to the state of the bladder and rectum, before any special treatment to reduce its weight is resorted to. For all these conditions yield far more readily to treatment after the uterus is replaced. In some cases of inflammation or extreme congestion, the introduction of the sound would be injudicious, until the tenderness had been diminished by the use of leeches to the os uteri, and other antiphlogistic measures; and reposition might be impracticable without the aid of this instrument. I seldom delay, however, to use the uterine sound at once, (though it gives some pain,) for the reasons above stated; but in a proportionately very small number of cases, I should not feel at liberty to do so. But for the particulars of the treatment of these conditions, and for ulceration also, if it coexist with the displacement, I refer to the fourth lecture, (p. 525-6.)

2d. *Replace the uterus.*—But previously, the bladder and the rectum should be evacuated, as before stated, and the patient placed in the proper position. If for any reason the uterine sound is not to be used, she may be placed as in the case of retroversion during pregnancy, (p. 129.) But otherwise, she may lie on the back, as specified in the preceding lecture, (p. 26;) and the sound is to be introduced, and the reposition effected, as there explained.*

3d. But supposing the womb to be replaced; will it under any circumstances remain so without direct mechanical support? Very rarely indeed. I have thus far met with but two instances in which a single replacement sufficed; and both these were cases in which the displacement had been suddenly induced. Usually, the uterus falls

* For a description of an instrument devised by the late Dr. Bond, of Philadelphia, for the replacement of the uterus in posterior displacements, see *Am. Journ. of Med. Sciences*, April, 1849, p. 408.

back again in a few minutes, if not the instant the sound is withdrawn; though in cases of complete reduplication, it may be arrested for a time at the second degree. Some appliance must therefore be resorted to, which will act continuously for a time, to prevent the complete relapse. And now comes the question whether we shall merely attempt to keep it more nearly in place than we found it, i. e., convert the third degree or the second into the second or the first; or shall we endeavor to keep it in its normal position? And it is precisely at this point that the curative or radical treatment, as I shall term it, diverges from the palliative treatment most commonly resorted to. If we believe with the authority before quoted, that displacement cannot occur if the vagina be supported at its normal length and height, we may introduce a pessary into the vagina, so as to elongate it to its normal extent, and take it for granted that the uterus is precisely in its normal condition. But since a reference to fig. 1 will show you the impossibility of preventing all backward displacement of the body of the uterus by an instrument in the vagina, unless the latter rises almost to the level of the fundus itself, we must not be deluded by any such notion. The intra-vaginal appliance may generally push up the uterus so far that we cannot reach and detect the retroflexion, but it cannot possibly prevent its continuance in the first or second degree. Sometimes, also, the posterior wall of the vagina is so short that the instrument cannot be made to rise high enough to support the fundus even in the second degree of retroflexion; and hence it becomes almost, if not quite, useless.

I therefore hold the following propositions to be incontrovertible:

1. *It is impossible entirely to prevent posterior displacement by any appliance in the vagina alone.*
2. *The only agent which can certainly retain the uterus in place, after replacement in case of retroflexion, is an instrument passed into the uterine cavity,* (an intra-uterine pessary.)*

There is, therefore, a propriety in distinguishing between the treatment which does not, and that which does, recognize the truth of these propositions; and I have termed the latter the radical treatment, and the former the palliative.

1. In speaking of the treatment of retroflexion which is most commonly resorted to as the *palliative*, I by no means underrate its value

* The introduction of an India-rubber bag into the rectum, to be subsequently inflated, is no exception to this proposition. I had tried them without satisfaction, and discarded them, before I became aware that they had been proposed by Fourcet.

and importance. I simply allude to its actual *object and result*, viz., not to retain the uterus in its normal position, for this it cannot possibly do; but merely to keep it in a better position than that in which we found it. On the contrary, I affirm that this treatment often entirely removes all the symptoms, and sometimes effects a complete cure; and is alone to be adopted in nine-tenths of all the cases that occur.

With the understanding, then, that we are not to attempt the radical method, what instrument shall be used to improve the position of the uterus? One would use Hodge's pessary (the horse-shoe pessary) in all cases, and another the globe pessary; while I should, in most cases, recommend the ring pessary, (or steel spring covered with gutta-percha, or a ring of tin,) which I have before described, (Lect. 2, p. 258.) It must, however, be remembered that the value of the instrument depends on the distance to which it carries the posterior wall of the vagina upward and backward; so as at the same time to prevent the fundus uteri from falling downward and backward by supporting it through the vaginal wall, while it closes the Douglass *cul-de-sac* by its pressure backward. To accomplish this effectually, the instrument must have greater antero-posterior than bi-lateral dimensions, and hence Dr. Hodge's instrument is well adapted to this use. The same result is secured by the gutta-percha ring, or that of tin, they being previously set in the elliptical or ovoid form. If you warm the former till it becomes flexible, and then give it the required form by pressure in the hand, and still retaining it in this form, plunge it for a moment into cold water, it will permanently maintain it. The tin instrument is, of course, moulded into the required shape at once, and I often use it in the form here shown, or even more elongated. (Fig. 7.)



FIG. 7.

But do not forget that the higher the instrument rises posteriorly, the better. After the application of the instrument, the patient is allowed to exercise more or less, according to circumstances; and which I need not specify here. Its subsequent management is the same as laid down in Lect. ii., p. 257.

But you must not be surprised nor discouraged to find the uterus very nearly in its former abnormal position, the next time you examine your patient. By repeated replacements, however, and readjustments of the instrument, you may expect finally to remove the symptoms of the displacement at least; and which in many instances do not again return. At the clinique, though the patients present themselves but once a week, you have seen cases apparently cured by these repeated replacements, and the con-

stant use of the pessary; though the sound still showed some inclination backward of the fundus uteri. In private practice, however, the patient should be seen every second or third day.

How long should the pessary be worn? Several months at least, and perhaps a year or two, if gestation does not supervene. On its final removal, the patient usually feels the need of its support for a time, as in prolapsus. (Lect. iv., p. 527.)

Conception frequently occurs in those previously sterile, after the treatment I have recommended has been continued for two or three months, as you have observed. I have also seen this result follow in several instances in which I had not used the pessary at all, on account of an abnormal shortness of the vagina, but had simply used the uterine sound once in two or three days, and let the patient retain it from one to two hours at each introduction. All the symptoms of the displacement will also in some cases disappear under this management.

Finally, if adhesions exist which prevent the replacement of the uterus, a globe pessary may possibly promise something on the principle specified in Lect. iv., p. 526.

2. *The Radical Treatment of Retroflexion.*—The object of this modification of treatment being to maintain the uterus *in situ* after it has been replaced—it consists in the introduction into the uterine cavity of an instrument of sufficient length and firmness to render flexion of the neck upon the body impossible; or it differs from the preceding treatment only in the use of an intra-uterine support.

Much error of opinion has, till recently, existed in our profession in regard to the practicability of the treatment of which I now speak. Although Dr. Simpson several years ago reported a case in which a patient wore an intra-uterine instrument for ten months in succession, with impunity, Dr. Robert Lee strenuously maintained that, on account both of the danger and the inconvenience, no intra-uterine instrument should ever be used. Many practitioners, even at the present time, deny that the uterus, any more than the eye, will tolerate the constant contact of a foreign body, and speak of fatal results from attempts to compel it to do so. In respect to this indiscriminate denunciation, I have only to say that I have sometimes had patients wear an intra-uterine support for four months in succession, and I have never yet seen any dangerous symptoms result from their use. I can moreover add, that I have never, in a single instance, failed to find a patient tolerant of the instrument when I proposed and attempted to

use it. Our success, however, will depend (1) on a proper selection of the cases, and (2) on the form of the instrument we use.

1. The radical method should not be attempted if there be inflammation or congestion of the uterus, or much irritation and tenderness of the uterine cavity from any cause; or if there be ovarian congestion or inflammation. These being absent at first, or having been removed, we may, if the patient be vigorous and can command the necessary time and exemption from all opposing influences, commence the use of the intra-uterine support.

Before applying the intra-uterine support, I am accustomed to replace the uterus with the sound every other day, and then every day, and have the patient retain the instrument* at first an hour and then somewhat longer, from day to day. When the menstrual period returns I introduce the vaginal pessary, before recommended, (p. 36,) and allow it to remain till 48 to 72 hours after the period has passed, and then resume the daily use of the sound, as before. When the patient can retain it for four hours, without inconvenience, I use the intra-uterine instrument. This is, of course, to be watched, and if irritation or much pain ensues, it should be removed for a day or two, (a vaginal pessary being the mean time used,) and then reintroduced. Of course the patient is not expected to leave on a long journey with this instrument in place, even though she may have worn it a month without inconvenience; since it may get displaced, and cause irritation, and thus incur a discredit which it does not deserve. You would not hold yourselves responsible for the beneficial results of a splint applied in case of a fracture, unless you could examine it at proper intervals; nor would you allow your patient to escape from your observation while one was being used. Evidently the same principle should also here be adhered to. Many of the bad effects of this class of instruments have been due to carelessness in this respect on the part of the medical attendant.

It has usually required not more than three weeks to prepare the patient for the application of the intra-uterine support. It has generally been worn for four days to a week the first time; then for a longer period, after it has been removed for two or three days. A slight loss of blood occurs during the first two or three days, and afterwards a leucorrhœal discharge to some extent. In some cases the odor of the discharge is identical with that of the lochia after parturition. After the uterus is well accustomed to the contact of

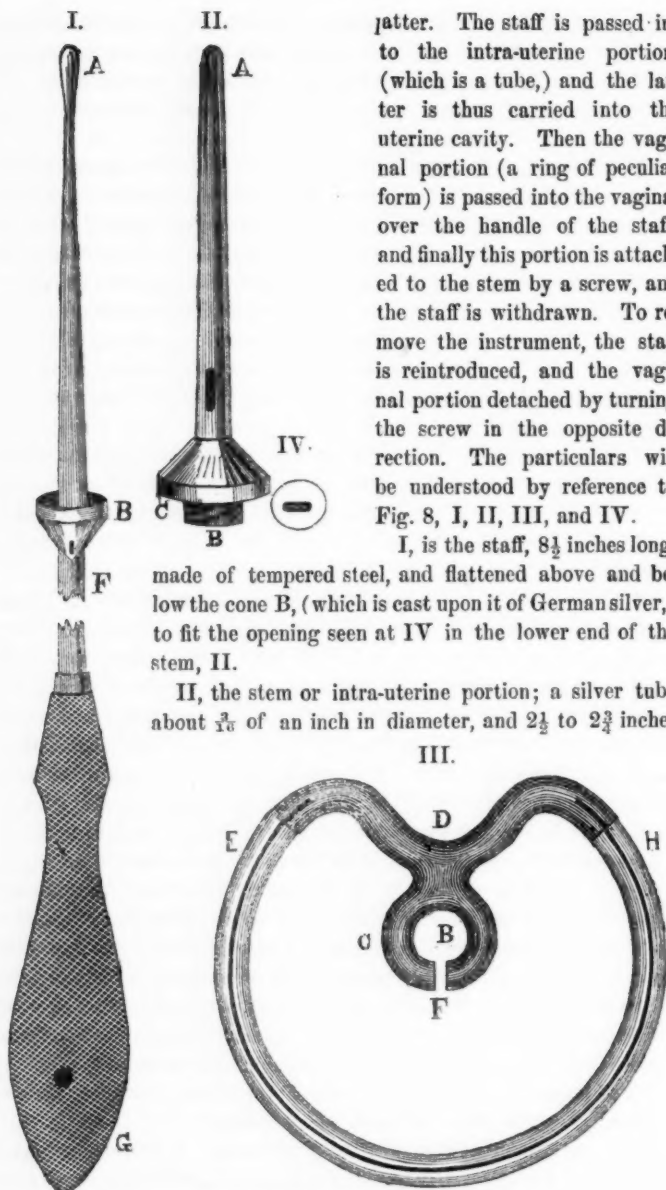
* It being attached to the thigh by a tape.

the instrument, it need not be removed during the catamenial period; but injections of soap and water are to be freely used as soon as the period has passed, and of water daily under other circumstances. I have never found it necessary to use an instrument more than four months in any single case.

2. But very much depends on the mechanism of the intra-uterine instrument used; and I did not obtain so favorable results till I had devised one quite unlike those which had preceded, and of which I will proceed to give you an account. I had found Prof. Simpson's intra-uterine pessary, and Valleix's modification of it, difficult of introduction, heavy and irritating to the patient, and very inconvenient, on account of their external appliances for maintaining the stem in the uterine cavity. And about seven years since I applied myself to the production of an instrument which should as far as possible be exempt from these defects.

After much experimentation, I adopted, as the easiest method of application, the principle of introducing the intra-uterine portion or stem *by itself*; and then, while still holding it in place, attaching to it another portion in the vagina, which should retain the former in the uterine cavity, and thus rid the patient of all external apparatus. It was the next step to decide of what material to make the different parts of the instrument; gum-elastic, gutta-percha, and several of the metals, being the principal substances experimented upon. I finally discarded gum-elastic and gutta-percha, (except in the vaginal portion of the instrument,) and adopted the form and composition I am about to specify. It required more time than you would suppose to bring the instrument to its present state; and in August, 1856, I announced it in the MONTHLY. I had, in the course of my investigations, also tried to attach the vaginal portion (of a different form from the present) to the intra-uterine portion, and introduce both at the same time; but gave up the idea, on account of the greater difficulty of introducing the stem into the uterine cavity. Dr. D. S. Conant, of this city, acting upon suggestions first made by myself, has, however, devised an instrument made of gutta-percha, in accordance with this idea; the vaginal portion consisting of two wings attached to the stem by hinges, (an arrangement greatly facilitating its introduction,) and which I am assured fulfills its object well. I had used a similarly formed instrument, the vaginal portion consisting of a thick plate of gum-elastic; but discarded it, as before stated.

The instrument I have used of late consists of three portions: a staff, the intra-uterine portion, or stem, and a vaginal support to the



matter. The staff is passed into the intra-uterine portion, (which is a tube,) and the latter is thus carried into the uterine cavity. Then the vaginal portion (a ring of peculiar form) is passed into the vagina, over the handle of the staff; and finally this portion is attached to the stem by a screw, and the staff is withdrawn. To remove the instrument, the staff is reintroduced, and the vaginal portion detached by turning the screw in the opposite direction. The particulars will be understood by reference to Fig. 8, I, II, III, and IV.

I, is the staff, $8\frac{1}{2}$ inches long, made of tempered steel, and flattened above and below the cone B, (which is cast upon it of German silver,) to fit the opening seen at IV in the lower end of the stem, II.

II, the stem or intra-uterine portion; a silver tube about $\frac{2}{16}$ of an inch in diameter, and $2\frac{1}{2}$ to $2\frac{3}{4}$ inches

FIG. 8.

long, with the cone C cast upon it of German silver. It has an eye like that of a catheter as seen above C, and another near its upper extremity on the opposite side, for the transmission of the menstrual fluid. B is a screw with a coarse thread, making one turn and a quarter.

III, is the ring, or vaginal support of the stem. The upper portion, shaded dark, is made of German silver, its two arms being cylindrical, and about $\frac{2}{6}$ of an inch in diameter; the projecting central part is flat, and $\frac{1}{8}$ inch thick. The dark line extending from E to H is a steel watch-spring, let into the arms at those points, and secured by rivets; and the spring is covered by gutta-percha, so as to give this part of the ring the same diameter as the metallic portion, ($\frac{2}{6}$ inch or more.) F is a slot, through which the portion of the staff F passes in, attaching the ring to the stem; the central portion has the same diameter as the cone C, on the stem; and the opening, B, corresponds precisely (presenting a female screw) with the thread on the stem. The curve D corresponds with the urethra, and is, of course, in front when the instrument is in place in the vagina. Finally, the stem and other metallic portions of the instrument are gilded by the galvanic process.

IV, shows the long oval opening at the lower end of the stem, corresponding to the shape of the staff above B.

It will be seen that the object of the cone B on the staff is to bring the screw on the stem to correspond accurately with the opening B, in the ring or vaginal portion. When this correspondence is made, the stem is attached to the ring by turning the staff once and a quarter round, when the screw takes its place, and the staff is withdrawn.

The stem is passed into the uterus, either straight or slightly curved, and is retained on the staff by slightly curving the latter before it is passed into the stem. I have also caused a hole to be drilled through the handle of the staff, and another vertically through the cone B, so that a double thread, first inclosing the stem above C in its loop, and then passed through the eye of the stem and the opening IV, and then through the vertical hole in the cone B, to be tied finally to the handle, may prevent the least displacement of the screw from the cone B till the screw is in its place. Then the thread is untied and drawn away by one end, after the staff is removed.

The length of the stem and the size of the ring must of course be adapted to each particular case. Its *form* is modified as on p. 136.

I do not, by any means, claim perfection for the instrument I have described, and shall be happy to see other and better applications of

the principle it was the first to illustrate. I regard it as possessing the following advantages over its predecessors:

1. It is easy of application. I have never failed in the attempt to apply it.

2. The vaginal portion being elastic, allows the uterus to yield somewhat to sudden pressure from above, and thus the instrument gives the patient less uterine irritation. If, however, the ring is cast in tin in a single piece, it answers a good purpose, and is of course less expensive.

3. It does away with all external bandages and other appliances, and thus relieves the patient from an abiding consciousness that she is wearing an instrument, at the same time that it removes all inconvenience from them.*

II. It is unnecessary to speak at length of the *general* and *moral* treatment of retroflexion, since nothing peculiar to this displacement is here required; and I have therefore only to refer to my remarks under those heads in the 4th lecture, (p. 530.)

The anterior displacements will be the subject of the next lecture.

MONTHLY SUMMARY OF MEDICAL JOURNALISM.

By O. C. GIBBS, M.D., Frewsburg, N. Y.

Climatic Relations of Consumption.—In the *Lancet* and *Observer* for June, Dr. A. P. Dutcher has an article upon the influence of *climate* and *cold* in the production of consumption. He does not believe tubercle to have an inflammatory origin, neither does he believe that cold is influential in the production of consumption. In regard to a favorable climate for consumptives, he says: "We have in North America, in the United States, all the variety of climate that is to be found in the world; and if there be one spot on this globe more likely to prove serviceable to consumptives than any other, it may be met with here." * * * "There is an extensive district bordering upon the extreme South of the United States which undoubtedly, in point of salubrity and adaptation of climate, must equal, if not surpass, any other country on the globe as a residence for consumptives. I refer to the State of Texas; and if the reports of travelers speak truth, this region will yet be the paradise of the world—at least so far as its geography and climate are concerned."

* It is made by Otto & Reynders, 58 Chatham Street.

We quote the above for the purpose of making one remark, the idea of which, we believe, is too often overlooked in choosing a residence for consumptives. We believe everything depends upon the *native climate of the patient*. To send a patient, born and reared in Maine, or anywhere in the extreme Northern States, to Texas, would result in the enervation and de-energization of the patient, and thus invite disease and death, the very things it were desirable to avoid. As we have often previously said, we say now with emphasis, *we would rather send a consumptive friend four degrees north, than ten south, providing we could select the locality and control the habits of the patient*.

Chlorate of Potash in Secondary Syphilis.—In the *Lancet and Observer* for June, Dr. W. H. Bryant has an article upon the curative action of chlorate of potash over secondary syphilis. His usual dose is eight grains, repeated every four hours, and improvement, he says, is usually manifested in a very few days. He concludes his paper by saying, "It is not my intention to say that potassæ chloras is a specific for syphilis, but merely to say that in my honest opinion it is a very valuable addition to the therapeutics of this loathsome disease."

Diphtheria.—In an article upon diphtheria, by J. H. Barbour, in the *Lancet and Observer* for June, the author speaks highly of the following formula:

"R.—Chlorate of potassa,	℥j.
Sulph. quinine,	grs. xvj.
Water,	℥xvj. Mix.

Dose from a tea-spoonful to a table-spoonful every three hours, according to age. In cases where there is a pale, moist, cool skin, a frequent and soft pulse, the addition of Bourbon whiskey to the above formula will prove of great benefit." Our readers will remember that at the time of the preparation of our last *Summary*, we were having some experience with this fearful disease, and then spoke very favorably of whiskey. In the last two months we have had considerable experience in the treatment of diphtheria, and in view of that experience, we would say, be the other treatment what it may, both local and constitutional, by all means give whiskey from the first. In every case in which we have got our patients to take from half a pint to a pint, daily, (adults we mean,) from the first manifestation of the disease, great prostration has been prevented, and recovery has been very speedy. In those cases in which it has not been taken, with only one exception, the cases have protracted through a period of from three to five weeks, and convalescence has been slow, and not unlike a bad case of typhoid fever.

Paracentesis Thoracis.—In the *N. O. Medical News and Hospital Gazette* for June, in the "*Clinical Reports of Cases observed at the Charity Hospital*," Prof. Austin Flint has the following remarks upon paracentesis thoracis: "The question then arises, is it judicious to resort to paracentesis in ordinary pleurisy? There can be no doubt of its propriety when, from the accumulation of liquid, life is threatened. But it seems to me the question may be answered affirmatively with reference not alone to these, but to nearly all cases of the disease. In the first place, the innocuousness of the operation is sufficiently proved by clinical experience. It is not only a trivial operation as regards pain and immediate danger of unpleasant results, but it leads to no remote evils; hence, it is open to no serious objections. But it has certain positive recommendations; let us mention some of these. It effects directly, speedily, and certainly, the main object of the treatment in chronic pleurisy, viz., the removal of the effused liquid. Remedies, on the other hand, effect this object indirectly, slowly, and are not always reliable. It accomplishes the object of treatment with little or no disturbance of the system, and without reducing the strength of the patient. Remedies, on the contrary, give rise to more or less disorder, and reduce the patient's strength. It preserves the lung from the effects of long-continued compression, and the expansion is, therefore, more complete when the liquid is removed. For this reason, there will be likely to occur less contraction of the affected side than when the liquid is slowly carried away by absorption. These recommendations render paracentesis judicious, as a rule, in cases of chronic pleurisy, exclusive of those in which absorption cannot be effected by the usual therapeutical measures and those in which the quantity of liquid, or its rapid accumulation, occasions great distress and endangers life."

Liquor Amnii.—In the *N. O. Medical News and Hospital Gazette*, for June, Prof. D. Warren Brickell has a very interesting and able paper on the *function* of the liquor amnii. He enumerates all the functions ascribed to it by obstetrical writers, fourteen in all. The first eight enumerated he considers quite visionary, and, with perhaps one exception, entirely unfounded in fact. The eight rejected, each has one or more of such names as Churchill, Rigby, Dewees, Tyler Smith, Baudelocque, Cazeaux, Ramsbotham, &c., in their support. Prof. Brickell urges his objections forcibly, and we think conclusively. The functions named by authors to which he gives his assent are the following: 1st, The liquor amnii secures the fœtus from external violence; 2d, It protects the fœtus from the uterus; 3d, It protects the

cord and placenta from pressure during gestation and labor, and thus preserves intact the circulation of the child; 4th, It assists dilatation of the os uteri in labor; 5th, It favors the presentation of the head of the child; and 6th, It favors the development of the fœtus. The *third* and *fifth* function he considers of the first importance, though insisted upon by only a very few of obstetric writers. To the above functions Prof. Brickell adds another, thus: "I assert that an important function of the liquor amnii is to counteract the specific gravity of the fœtus, and thus prevent disagreeable physical results to the woman in the later months of pregnancy, when the weight of the child becomes considerable. At full term the well-developed fœtus weighs from six and a half to eight pounds; and from the seventh to the ninth month of pregnancy, the weight varies between four and a half to five pounds and these first-named weights." We have not the space to give the author's argument in full, and must be content with a synopsis. "I find by actual experiment, that if a five-pound weight is placed on the back of my hand and the palmar surface of the hand is then applied to a table—thus establishing counter-pressure—soon pain is experienced, and it is not long before that pain becomes insufferable—the degree of endurance, of course, varying in different persons, according to the degree of muscular development, &c.; and I am sure that long continuance of the pressure would cause death of the tissues immediately, under the weight." * * * * *

"If there was no water in the womb, the weight of four and a half to eight pounds would be pressing on the womb tissue (inferiorly,) with the counter-pressure of the pelvis below; and this, as we have shown, could not be borne." Now, with all due respect for the opinions of Prof. Brickell, we cannot avoid the conclusion, that this function is somewhat visionary and chimerical. We have certainly seen patients in whom the liquor amnii had escaped, and yet the fœtus of near maturity was carried for days, and, in one or two rare instances, for weeks, without any expressions of discomfort from pressure, &c. We all know that females occasionally carry solid tumors, surrounded by no fluid, for years, without any of those disastrous effects upon the tissues to which Prof. Brickell alludes. To carry a weight of that of the human head upon the shoulders, would, in a few hours, become a tiresome feat; but to carry the head where nature placed it, is a different matter altogether.

Quinine and Malarial Fever.—In our *Summary* for December last, we gave the substance of a paper by Dr. W. A. Brown, of Texas, which appeared in the October number of the *Nashville Journal* of

Medicine and Surgery. Strictures upon that article have called forth another from Dr. Brown, in the June number of the above-mentioned journal. The importance of the subject is our apology for again alluding to the subject. The main points of Dr. Brown's paper are, 1st, that "quinine is, *per se*, the remedy, in all forms, all stages, and all complications of malarial fevers;" 2d, that "enlarged spleen, deranged liver, indigestion, &c., &c., following fevers of a malarious character, are the result of *treatment*, and not of malaria." Dr. Brown believes all "preparatory treatment" is entirely superfluous and injurious—"for all stages, and all complications," quinine is the remedy. "What would you think," he says, "of the physician who, if called to treat a case of poisoning, was first to commence setting a single organ right, without removing the poison, or neutralizing it by suitable antidotes?" Though Dr. Brown regards quinine the all-important remedy in malarial diseases, yet he is no advocate for large doses. He says, "It is very seldom that ten grains will not succeed as well as twenty; and owing to the unpleasant effect of quinine upon the nervous system, we should try to find the least doses that are positively reliable, rather than how much may be taken without positive injury."

Our opinions accord with those of Dr. Brown, and our experience confirms our opinions. Our earliest observation of disease was in a malarial region, and we early saw the necessity of making a shorter cut to health, in our intermittent and remittent cases, than was obtainable by the usual treatment. In the accomplishment of this end, we converted the sulphate of quinine into a solution of the tartrate, by the addition of tartaric acid and water, or some other vehicle. We gave, at first, an equivalent of from eight to ten grains of the sulphate of quinine, and from two to four grains of opium. This was given from *two to four hours before the expected paroxysm*, AND NOT REPEATED UNTIL THE NEXT DAY, and then in only half the dose, if the paroxysm was prevented by the first. After this, the from four to five grain dose was given daily for a week, and then weekly during the remainder of the malarial season. We claim this as an original idea and use of this remedy. In a disease, having daily exacerbations and remissions, the remedy designed to supersede it by its specific action, should be given *only daily*. The dose should be such as to supersede the paroxysm—anything more than this, and other doses than the one, only tease the system unnecessarily. Under this treatment, be the stage or complications what they might, a cure was always effected, and that cure was permanent. Perhaps farther South, larger doses might be required. It will be seen that the amount of quinine used

here is much less than that employed by many, and yet the results are, in every instance, immediate cure. The patients were not confined to the bed with four or five weeks of preparatory treatment, but were usually out of bed on the second or third day.

These opinions, and the result of our experience, were communicated to, and published in, the January issue of the *North American Medico-Chirurgical Review*, for 1857. So much for our opinions and experiences in this matter. In conclusion, we take great pleasure in recommending to the attention of our readers the papers of Dr. Brown in the *Nashville Journal of Medicine and Surgery*, and also the able editorials, upon the same subject, by Professor W. K. Bowling, of Nashville.

Since writing the above, a paper or two has fallen under our observation that can best be considered here. In the *Chicago Medical Journal*, for June, Dr. R. C. Hamill has a paper upon the sulphate of quinine. Dr. Hamill believes there are many cases of irritative fever, simulating a typhoid, that are "brought about by the exhibition of quinine, at stages of disease when the system was not prepared for its healthful action, &c." Our belief differs somewhat from that here expressed. We believe there are many cases of malarial disease that *degenerate into* an irritative fever of a typhoid type, because quinine is withheld, in a worse than useless attempt at a fanciful preparation of the system for that agent. This opinion is based upon our experience and what we deem a careful observation of the diseases of a malarious origin and their treatment. But Dr. Hamill rules our experience out, as the following quotation will show: "I would not choose him for a careful observer, who has settled down upon the theory, that quinine is anti-malarious, and therefore applicable to all cases of malarial origin." * * "I yield to no one in my admiration of the sulphate of quinine in the treatment of disease where it has a known virtue; but I must be convinced that the *system is in that state of preparation* which admits of the development of its legitimate power, before I am willing to exhibit it even in a case of *ague*." (The italics are ours.) What will Dr. Brown and Prof. Bowling say to this? The former says he has "spent manhood's prime in search of more light;" yet Dr. Hamill would not regard him as a careful observer. We would commend to the attention of Dr. Hamill the papers of Dr. Brown, referred to above, and if they do not convince him of the error of his position, if he will practice upon the instructions there given, we are confident his views will undergo a modification. For ourselves, we feel that certainty which successful experience gives, supported by as

good authority as can be found in the country, that quinine, when its powers are fully and judiciously brought out, is abundantly adequate to meet all the varying conditions of malarial disease.

Dr. Hamill has some singular notions in regard to the action of quinine. He says, "I deny the tonic property of quinine, as taken for granted by Dr. Headland, and those who adopt his views, and find no argument in the discussion of this point which would not apply with as great, if not greater, force to its exclusion, upon the principle that it has so many points of resemblance to urea and uric acid, which are poisons, and their retention in the blood is the cause of irritative fever." Any tonic property it is found to possess, he believes to be the result of its stimulant action upon the nerves and absorbents of the stomach.

In the *Chicago Medical Examiner* for June, Dr. J. N. Graham has an article upon quinine, in which the correctness of some of the opinions of Dr. Hamill are called in question. We have not the space at disposal for a synopsis of Dr. Graham's paper. Suffice it to say that he regards it as a tonic, and safe in all stages of malarious disease. He, however, regards it as a *stimulant*, and admits its *sedative* property only under certain circumstances. We shall have a word more to say in reference to the stimulant action of quinine a little further on. It may not be amiss to state here, that the lamented Dr. Drake regarded it as a "*sedative and antispasmodic narcotic*."

Pursuing this subject, we beg leave to refer to a paper upon the subject of quinine, by Dr. M. Marsh, of Port Hudson, and published in the June number of the *N. O. Medical News and Hospital Gazette*, in which some opinions of ours, upon the subject of the therapeutic action of quinine, are combated with earnestness. Dr. Marsh says that "intermittents and remittents of miasmatic origin *are the only diseases* promptly relieved by quinine, and that its use, as a special remedy in the treatment of inflammation, is not indicated, and is useless, if not *positively injurious*." (The italics are ours.) When an inflammation recovers under quinine, it is his opinion that that agent "generally retards, and never expedites, a cure." Upon this point we should, of course, take issue, did space permit; as it is, we will only say that all inflammations accompanying a malarious disease, and connected with it in a common origin, is best treated by quinine; and, in our judgment, there are many other cases of inflammation, unconnected with malaria, that would derive great benefit from the same treatment. Of the agent in question, Dr. Marsh says, "In some conditions of the system, accompanied by local irritation, it acts as an irritant or

stimulant, producing excitement of the vascular system, manifested by *increased frequency and fullness of the pulse*, and augmented respiration, furred tongue, and other symptoms of a febrile state, with increased plasticity or inflammatory condition of the blood." This does not correspond with the statement of Dr. Cochran, and quoted in one of the papers above referred to, when he says of quinine, "if administered in large doses, and frequently repeated, it *defibrinates* the blood, *rendering* it fluid and incoagulable." If quinine be a stimulant, it has not in our hands increased the frequency of the pulse. In such cases as we deem it appropriate, it almost invariably acts as a *sedative*, lessening the frequency of the heart's action. We well remember a case of pneumonia to which we were called in consultation. The patient had been bled, and antimony had been liberally administered, also calomel. Now, at the end of the tenth day the cough was dry and harsh, skin dry, tongue dry and cracked, the pulse about 140, and every way the patient looked unpromising. The more essential part of our prescription was three grains of quinine and half a grain of opium, to be repeated every four hours. The attending physician objected to the quinine, and would not be persuaded to administer unless the friends could be apprised of the fact that he objected. To this we consented, and, confident of the result, we made a show of compromise, by saying that if the pulse did not come down ten beats per minute from the effect of the first three powders, he might discontinue. The medicine was commenced with, and the results so satisfactory that it was continued, and in forty-eight hours the pulse came down to eighty-five, thus losing over sixty beats per minute. At that time, too, the skin was moist, the cough loose, expectoration easy, tongue cleaning, and every way the patient was improved. The treatment was continued, and the patient made a good recovery. It is but proper to say that the case was entirely free from malarious influence. In this case the quinine did not increase the frequency of the pulse, and we could not be easily convinced that it was "positively injurious," retarding the cure.

Upon the above subject we have extended remark beyond the usual scope and intent of our articles. The importance of the subject must be our apology. The remedial power of quinine, even in malarious diseases, is not fully appreciated, except by a minority of the profession. Those who waste weeks, or even days, in the preparatory treatment for this agent, in malarious diseases, be the state or complication what it may, do so, perhaps, to the benefit of their pockets, but to the great sacrifice of comfort and increase of risk that is attainable by the

treatment advocated by Dr. Brown, in the paper first here referred to. The MONTHLY finds many readers in malarious localities; and if the above remarks shall, even in a small degree, contribute to the sufferers under their charge and elicit a multiplied experience, they will not have failed of their design.

Veratrum Viride in Pneumonia.—In the *Nashville Journal of Medicine and Surgery*, for June, Dr. A. A. Davidson has an article upon the use of *veratrum viride* in pneumonia. This is not new treatment, but his experience and confidence are such as to justify their repetition. He says, "I have followed no other particular treatment for the last two years in pneumonia and pleurisy than the medicine in question, and I am happy to say I have never seen a case terminate unfavorably under the treatment." In conclusion, he says, "I look upon the *veratrum* as being worth all the other treatments combined for pleurisy, pneumonia, and all the other diseases of an inflammatory nature, when carefully and judiciously administered. I speak this candidly, because it is my own experience that prompts me to do so."

Erectile Tumors.—In the *Chicago Medical Journal* for June, Prof. Brainard has a lengthy and able article upon erectile tumors and their treatment. Some such tumors he has been treating successfully with the injection of a solution of the *lactate of iron*. We have not space for a synopsis of his paper, and will simply give his conclusions. He says, "The relative merits of the different methods of treating erectile tumors may be summed up as follows:

I. Excision should be performed in every case where the size and situation of the tumor will admit of its being performed. This is almost as much a rule in these cases as in cancer. The exceptions are the slight cases which may be trusted without treatment until they increase in size.

II. When excision would cause too great a loss of substance, danger from hæmorrhage, or when, from any cause, excision is objected to, strangulation is to be preferred next in order, and whether effected with ligature alone, or with needles, or other means, it should always, if possible, embrace the whole diseased structure.

III. In limited superficial navi and erectile tumors, particularly if placed over bony surfaces, compression will often diminish, if not cure, the disease.

IV. In deep-seated tumors, particularly aneurisms by anastomosis, cauterization with the hot needles is an extremely efficient remedy, either by itself or in connection with other means.

V. Setons or metallic needles may be used in the venous forms of

the disease. They are more effectual when placed to some extent in sound tissue.

VI. Ligature of the principal artery leading to the part is adapted to the variety called aneurism by anastomosis, the accidental thrilling variety, and particularly to that variety situated in the orbit of the eye. I believe, however, that it is more dangerous and less necessary than is generally supposed.

VII. Vesicants, escharotics and caustics, are adapted to complete a cure, when a small portion of tissue remains after excision, strangulation, or seton. They are uncertain, and little to be relied on.

VIII. A combination of several of these methods of treatment will often be found advisable."

Neuralgia.—In the *Chicago Medical Examiner* for June, Dr. L. D. Robinson has an article upon neuralgia, in which his views of its pathology are given, and also his plan of treatment. We subjoin only the treatment. In a case reported, the treatment advised, which, he says, was that usually advised by him, was the following:

"R.—Chiniodine,	24 grs.
Pulv. Capsicum,	5 grs.
Strychnia,	1 gr.

M.—fiat. pil. No. 10. Dose—a pill before each meal.

After using the above sufficiently long to break down the paroxysms, and give the patient relief, we prescribed the following:

R.—Quevenne's iron,	60 grs.
Quinine,	60 "
Ext. Hyosciami,	40 "
Pulvis Capsici,	20 "

Divide into 40 pills. Dose, a pill after each meal, and to be continued until completely relieved of debility."

With this treatment, the author says he has been remarkably successful in the treatment of idiopathic neuralgia. Though we have great faith in the powers of strychnine over many cases of disease, we cannot help thinking the dose is imprudently large to commence with in the formula above. Our commencement dose for an adult is one-twentieth of a grain; in the formula above, it is twice that.

Endermic Use of Animal Fat in Typhoid Fever.—In the *Southern Medical and Surgical Journal* for June, Dr. Baker, of Alabama, has an article upon the above subject. Dr. Baker thus reports his experience: "I have for the past five years employed it (animal oil) in all cases (of typhoid fever) where there existed a harsh and dry skin, with the unfailing effect of rendering it soft and pliant, just as it would

an old piece of indurated leather. In scarlet fever, its application is especially indicated both during the height of the fever and in the subsequent stage of desquamation. I have found nothing so beneficial in softening the skin and soothing the irritation during the eruption; and I have also ascertained that its continued application during the period of convalescence, combined with the occasional use of the warm bath, tends, almost certainly, to prevent the subsequent and so much dreaded dropsical effusion.

In that dry, hot, and husky condition of the skin so often observed during the first two weeks of typhoid fever, when the hand may be held in contact, for any length of time, with the patient's skin, without producing the slightest moisture, or changing in the least its dry and harsh state, inunction produces the most happy effect; the hot, dry, shriveled and harsh skin becoming cool, moist, smooth and pliant."

We should be happy to make several extracts from the lengthy paper of Dr. Baker, but must content ourselves with one or two more. He says, "The reason why I have recommended animal fat in typhoid fever, originates in no idea of its exclusive adaptedness to that disease. Its good effects, when thus applied, are equally manifest in many other wasting and long-continued diseases; and here, in passing, I will say, that it is especially advantageous in the *tabes mesenterica*, occurring in the second year of infancy. In such cases, the endermic application of cod-liver oil affords more promise of success than all other medication combined. Indeed, what medical practitioner in the Southern country has not heard the old nurses on plantations boasting of the cures they have worked by 'washing' some little weak-necked, scrawny-limbed, big-bellied infant in 'pot-liquor?'"

Dr. Baker concludes his paper thus: "Such is my faith! May I be pardoned for saying, only with that degree of confidence with which the truth should be proclaimed, that I prove my faith by my works, in safely conducting, with these means, (animal fat externally and turpentine and brandy internally,) many patients through attacks of typhoid fever, and bringing them out, in the end, emaciated to no great degree, but on the contrary, with such an integrity of tissue, as insures a much more speedy convalescence than takes place in ordinary recoveries."

Chloroform Poisoning.—At a late meeting of the Medical Association of Georgia, as per report in the June issue of the *Southern Medical and Surgical Journal*, Prof. W. F. Westmoreland "reported success in restoring respiration in animals, when chloroformization had

been carried too far, by artificial respiration, effected by the introduction into the trachea of a large elastic bougie, through which air was forced by common hand-bellows."

Camphor as an Antidote to Strychnine Poisoning.—In the *Pacific Medical and Surgical Journal*, for June, Dr. M. T. Dodge reports a case of poisoning with strychnine, entirely relieved by the administration of camphor. According to the report, *five grains* of strychnine had been taken *three hours previously*. Ten grains of camphor were given in emulsion, and repeated every half hour or hour for seven hours, when the spasms entirely ceased, and the patient rapidly recovered. It would certainly be a fortunate discovery should camphor be found to be a reliable antidote to the poisonous action of strychnine. The case reported lacks at least two essential points to make it available as proof upon this point. It is thought by many that much of the strychnine in use is nearly inert, and, if taken as claimed, there is no proof that the article was genuine. More than this, there is no proof, but the patient's statement, that the five grains of strychnine had been taken at all. There is certainly one suspicious fact in the case, that must in some measure detract from our confidence in the antidotal power of camphor. *Three hours* had elapsed from the taking of the poison before remedial aid was had, and yet the patient was sitting up, and presented no very alarming symptoms. Prof. Wood says that, in cases of poisoning from strychnine, the alarming symptoms usually follow the administration in from ten minutes to half an hour. One of two things is evident: the five grains were not all taken, or the poison was not of standard strength; either would effect the result, so far as relates to the antidotal powers of camphor.

Collodion in Strangulated Hernia.—In the *American Medical Gazette*, for June, Prof. E. S. Cooper, of San Francisco, has an article upon the reduction of strangulated hernia by the application of collodion. He reports one case in which it succeeded after taxis failed. "A thick coating was applied all over the hernial tumor, which being permitted to dry and contract, another was put over it. After making two or three applications and witnessing the result, the patient was left in charge of a student, who was directed to apply the collodion (an article of much greater consistency than that in general use) every ten minutes, until my return. This course being continued for nearly two hours, the tumor was found soft, and reduced in size one-half or more—strangulation being, in fact, removed. The small portion of the hernial sac remaining out of the abdominal cavity was returned without the least difficulty."

Prof. Cooper gives the following conclusions: "1st, That we will always be safe in resorting to the use of collodion in strangulated hernia before using the knife, which, at best, is a dangerous remedy.

2d. If the collodion fails, the case will be none the worse for an operation, because two hours will generally be a long enough time in which to give it a trial; and during this period no more fluids can accumulate in the tumor, but on the other hand, part of those already collected will be sure to be forced out, whether strangulation is subdued entirely or not.

3d. That taxis should never be resorted to before collodion has been applied, because, in the former, bruising of the parts is liable to occur, but not in the latter, which, in addition, is much the more potent agent in pressing the blood out of the veins of the part, and thereby relieving the strangulation."

Strictures of the Urethra.—In the *American Medical Gazette* for June, Prof. James Bryan has an article upon the treatment of this troublesome and hitherto seldom-cured affection. For *fifteen years* past, Prof. Bryan has been treating strictures of the urethra by *internal section*; a mode of treatment which, he says, in that time, and with rather extensive experience, he has never known to fail. We must refer our readers to the original article for a description of the instrument used. He concludes his paper with the following remarks: "The more cartilaginous and impervious the stricture, the better; and I have yet to see a case in which I have failed to open a passage to the bladder. It is well known that the treatment by caustic, dilatation, and external section, are all followed, from time to time, by severe accidents, such as increase of the stricture, false passage, with urinary infiltration, fistula, &c., &c. I have, as yet, met with none of these things in this treatment, nor are any reported by Civiale, Strafford, Amussat, Dorner, Jameson, or others. *A priori* reasoning doubtless deters many from attempting the practice; but after a careful review of the results of other modes of practice, not excepting Symes' operations, I am clearly of the opinion, that in a majority of the cases of permanent stricture, the treatment by internal section, in the hands of careful and judicious surgeons, is by far the safest, most free from danger, most certain, and most satisfactory."

Typhoid Fever.—Dr. Levick, physician to the *Pennsylvania Hospital*, delivered a clinical lecture upon typhoid fever, which is reported in the *Medical and Surgical Reporter* for June 9th, in which some opinions are expressed which can never be too frequently repeated, especially to the younger members of the profession. Upon the points

discussed by Prof. Levick, our readers will remember that we have previously expressed opinions. In regard to cathartics, his views are so exactly like those we gave in a review of a work on Enteric Fever, published in the September issue of the MONTHLY, that we are pleased to adduce so high a corroboration. At first he would advise a dessert-spoonful of castor oil; and "after this," he says, "unless there be protracted constipation, I rarely give a cathartic of any kind, and do not trouble myself or the patient if he should not have a daily alvine evacuation. I have never believed that it was necessary to open the bowels every day, or even every second day, when they had been thus acted on in the beginning, and while the patient was suffering from this disease." In regard to food, he makes a few appropriate remarks, and says it "is as necessary for the sick as it is for the well." He adds, "The patient, not feeling the need of food, or with his perceptions and faculties so blunted by disease that he does not call for it, is allowed to pass hours, if not days, without food, or is fed with innutritious slops, which, unfit for the well, are even more so for the sick. Dr. Graves, long ago, called attention to this subject." The following is not less to our liking: "So, too, with the early, cautious administration of wine-whey. Do not wait until the patient has got into that condition in which, as the books express it, 'symptoms of prostration present themselves,' when stimulants are imperatively demanded; but so supply food and gentle stimulation that your patient will not fall into this condition, from which it sometimes happens that all stimulants are unable to raise him."

In regard to medicines we will instance only a remark or two. To quiet excessive nervous excitement, and procure rest at night, Prof. Levick would administer two tea-spoonsful of solution of sulphate of morphia, and one of spirits of nitre, at night. The first treatment which he would advise immediately following the opening of the bowels, in a majority of cases, is "one grain of blue mass, one-sixth of a grain of ipecac, and one-sixth of a grain of opium, every two hours." The mercurial is early omitted, the ipecac and opium being continued, and wine-whey, quinine, &c., as the case may require, are now early brought to bear. With the first tendency to any considerable and persistent dryness of the tongue, turpentine is resorted to, of which medicine he speaks in the highest terms.

We believe the great secret of success in the treatment of typhoid fever, as in all other diseases, consists in a thorough observation of the case, and, by timely remedies, *preventing* alarming symptoms. Those who medicate largely with specific remedies without distinct in-

dications, and those who trust their cases to nature wholly, Forbes like, meeting with remedies, only unnatural conditions and extra bad symptoms, alike fail in securing to their patients the full benefit of the healing art. It is better and far easier to *anticipate and ward off* a dying condition than to *reclaim* a patient from it.

Acute Rheumatism.—Prof. Levick, of the Pennsylvania Hospital, has for a little time back been experimenting with the chloride of propylamin. The reports are given in the several issues of the *Medical and Surgical Reporter* for June. Speaking of a certain typical case, he says, "I do not hesitate to say that I have never seen as severe a case of acute rheumatism so soon restored to health as this man has been; and without being prepared to decide positively as to the value of the remedy we have used, I feel bound to state that in the cases in which we have tried the chloride of propylamin the patients have regained their health much earlier than under the treatment ordinarily pursued."

Consumption.—In the clinical remarks of Prof. Levick, above referred to, we find the following, which is a little refreshing, now that cod-liver oil is going out of fashion, stimulants being decried by many, and blood-letting, &c., being advocated by a few. He says, "Good food easily assimilable, living in the open air, protected from exposure by suitable clothing, the *moderate* use of stimulants, such as ale, porter, or even a little good old whiskey, and as a medicine cod-liver oil, we believe will do more for the consumptive than any other mode of treatment."

We have no doubt of the propriety of stimulants in most cases of consumption, and, because of the difficulty in getting always pure whiskey, we have, of late, been using *malt wine*, prepared by John McKnight's Son, Albany, N. Y., and so far have been well pleased with the result.

Diphtheria.—In the *Medical and Surgical Reporter* for June 30th, Dr. A. M. Sigmund has an article upon diphtheria, erysipelas, &c. He believes that the causative poison of diphtheria, erysipelas, and scarlatina is the same in the three diseases. Thus he says, "I believe that the same constitutional poison which produces diphtheria and erysipelas is also capable of producing scarlatina, for I have seen in the same family persons attacked, some with diphtheria alone, some with it and erysipelas, and others, again, with the anginose variety of scarlatina. The precursory symptoms were almost the same, although in the case of scarlatina the symptoms were more violent and decided, and the febrile excitement much greater." Having a reasonable ex-

perience with diphtheria, we believe it to be a distinct disease. Under our observation it has resembled typhoid fever more than any other disease. We hope soon to find time to give the result of our observations upon diphtheria.

Rheumatism.—In the *Medical and Surgical Reporter* for June 30th, Dr. D. W. Bland has an article upon the treatment of acute rheumatism with the iodide of potassium. The following is the formula which he advises:

"R.—Potassæ Iodidi,	ʒj.
Vin. rad. colch.,	ʒss.
Sulph. morph.,	gr. ij.
Aquæ,	ʒvss. M.

A dessert-spoonful to be taken three times a day." As a local application he advises "a solution of muriate of ammonia in the proportion of ʒss. to a quart of water."

Singular Case of Loss of Hair.—In the *Boston Medical and Surgical Journal* for June 14th, Dr. H. O. Jewett reports the case of a boy "that when an infant had hair like other children, but when 4 or 5 years of age, and while in perfect health, it began to fall off, and in a few weeks left him completely hairless." Eyebrows, eyelashes, as well as every hair upon the head, came out; and five years later, at the time of the report, there was not the least evidence of any natural effort at reproduction.

Fœtus Carried Twenty-two Months Beyond Term.—Before the Boston Society for Medical Improvement, as per report in the *Boston Medical and Surgical Journal* for June 14th, Dr. Storer reported the case of a woman who carried the product of conception for more than two years and a half! At the full period she "was supposed to be in labor, and sent for her family physician to attend her." "The pains, however, were not constant, or of much force, and soon subsided entirely, never to return as true labor-pains." Twenty-two months later she died, having carried the product of conception the while, and menstruated *irregularly* until the time of her death.

"At the *autopsy* a very extensive adhesion was found between the fundus of the uterus and the small intestines, and also between its side and the sigmoid flexure of the colon. The Fallopian tubes and ovaries were found in their natural relations to the uterus. The uterus contained a fœtus in the natural position for delivery, but no trace of a placenta could be found. There was about a pint of thick yellow fluid in the uterine cavity. An opening in the left side of the uterus communicated with the interior of the colon, and the left hand and

forearm of the fœtus were passed into the bowel, as far as the elbow. Fæculent matter had passed into the cavity of the womb. The os uteri was entirely closed, and no trace could be found of it upon the inside."

Tracheotomy in Croup.—Before the Boston Society for Medical Improvement, as reported for the *Boston Medical and Surgical Journal* for June 14th, Dr. Bigelow expresses his opinion upon the above subject. He says that "in very young children it rarely avails, while in older ones it may be of considerable value; that after the age of three years the chance of life is, perhaps, increased by it; that after that period the ratio of recovery with operation probably increases with the increase of age; but that in *very young* children recovery after operation is rare; probably not greater than without it."

Quinine and Abortion.—Edward Warren, M.D., Editor of *The Medical Journal of North Carolina*, in the May issue of that journal, commenting upon an article from our *Summary*, says: "We have found nothing more likely to produce abortion in pregnancy than the administration of large doses of quinine."

Effects of Medicine on the Teeth.—Many people attribute the decay of their teeth to the effects of medicine. A common expression with such is, "since my health has been bad, I have taken so much medicine that it has ruined my teeth." Such forget that good health is all-important to the integrity of the teeth—they do not imagine that it is *disease* and not *medicine* that causes their decay. In the *Dental Cosmos*, for June, Dr. Robertson has an article upon the *effects of disease on the teeth*, in which the above fact is distinctly stated. We rejoice to see a dental surgeon vindicating the honor of medicine. Dr. Robertson, while he admits that the "*surroundings*" may be injured, denies even that calomel has any direct influence in causing the decay of teeth. We quote one experiment. "Dr. Westcott, in his experiments, found that teeth placed in a mixture of calomel and water of about the consistency of cream, and allowed to remain there for four months, came out as bright and as clean as when they were put in. And some years ago I placed one tooth, thoroughly cleansed from all foreign matter, into a vial with fifty grains of calomel mixed with about two or three fluid drachms of saliva, and at the end of six weeks no change was perceptible even by the aid of a powerful magnifying-glass."

EDITORIAL AND MISCELLANEOUS.

—The Report of the Committee of the New York State Medical Society on Pharmaceutical Preparations, published in the June issue of the MONTHLY, has elicited from several quarters commendatory remarks. From one of our correspondents, Dr. D. P. Francis, of New London, Conn., we have received a communication, indicating a method of adulteration not heretofore mentioned. We extract from this letter the following:

"I have read with interest the Report of the Committee on Pharmaceutical Preparations published in the June number of your magazine. The investigation was well-timed. The increasing demand for this class of remedies and their rapidly extending employment render it expedient that the fluid and solid extracts should be subjected to a rigid analysis and experiment by competent hands, in order that their intrinsic merits and demerits, as well as their comparative value over other forms of remedies, may be brought to some authoritative and final standard. At the same time, it cannot escape the attention of the reader, that at present, the widest diversity of opinion prevails among the profession in regard to their efficacy, as well as the value of preparations of the same drug from different laboratories. To a certain section of this report my attention was particularly drawn. In the language of the committee, 'it is very clear that the strength or value of the same drug, from the same makers, is not constant.' It is also stated, that 'some complain of their inequality, and it is no doubt owing to this fact that such different opinions are expressed concerning the extracts of the same drug. The committee, therefore, recommend extreme caution on the part of the manufacturers in their selection of material.'

"Now, while I admit that these objections do exist, (and tinctures are by no means free from them,) I believe that the cause may be successfully sought for, in a large number of instances, in a different quarter. I allude to the fact of their adulteration by retailers. If my own experience furnishes any just data, I think I am safe in saying that this reprehensible practice is carried on, (partly from a disbelief in the superiority of extracts over tinctures, and partly from pecuniary considerations,) to a greater or less extent, in nearly every town and city in the country. The empty or partially exhausted bottles of the manufacturers are frequently filled with tinctures and saturated solutions, and dispensed at the counter as 'Fluid Extracts.' So often

have I known this to be the case in my own practice, that I have at last determined to procure my supplies direct from the manufacturers; and thus far I have no reason to regret this determination. The presence of sediment, which, say the committee, is frequently noticed in the bottles, 'as they stand on the shelf of the apothecary,' may also, I believe, be referred to the practice of forming solutions from the solid extracts without filtration. In the preparations of the Messrs. Tilden & Co., when procured direct from them, I find all that can reasonably be expected of a medicinal plant. I presume the same may be said of the preparations of other makers, but I have not tried them. I would, therefore, respectfully urge upon the profession the propriety of inquiring carefully into the character of the fluids they purchase or prescribe; for only by this process can they hope to suppress a despicable and pernicious practice, which, while it enriches the unprincipled by tampering with the health of patients, throws unjust imputations on the American laboratories."

— Dr. Addison, the late distinguished Physician of Guy's Hospital, died June 29, in the 67th year of his age. Within a few months the profession of England has lost some of its greatest ornaments—Bright, Todd, and now Addison. Dr. Addison was born near Newcastle, took his medical degree in Edinburgh, and then went to London. He was a pupil of the celebrated Bateman, and himself became an acknowledged authority upon skin diseases. The splendid collection of wax models of skin diseases in the Museum of Guy's Hospital were made under his superintendence. Dr. Addison was not a voluminous writer, most of his communications being found in Guy's Hospital Reports. Like his fellow-laborer in the same field—Dr. Bright—his name will be associated with a form of disease his clear and acutely discriminating mind was enabled to detect in the labyrinth of diseased textures which were constantly submitted to his examination. The disease of the supra-renal capsules, called by him *melasma supra-renale*, will hereafter be known as *Morbus Addisonii*, a name given to it by Prof. Trousseau as soon as the lesion designated by its discoverer was recognized in France. This was undoubtedly Dr. Addison's greatest work, and gave an impulse to the study of the functions of the supra-renal capsules which has been subsequently thoroughly investigated by such distinguished physiologists as Brown-Séquard, Harley, Vulpian, and Virchow.

— Dr. Green's "Favorite Prescriptions of American Practitioners" has been translated into French, and has received a highly favorable notice in a recent number of the *Union Médicale*.